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Faculteit Bedrijfseconomische Wetenschappen

master handelsingenieur

Masterthesis

Hangt de niet-gebruikswaarde van biodiversiteitsverlies af van de oorzaak ?

Maité Bouchet
Ine Daniëls

Scriptie ingediend tot het behalen van de graad van master handelsingenieur, afstudeerrichting technologie in business

PROMOTOR :

Prof. dr. Sebastien LIZIN

BEGELEIDER :

De heer Anne NOBEL

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2021

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www.uhasselt.be
Universiteit Hasselt
Campus Hasselt:
Martelarenlaan 42 | 3500 Hasselt
Campus Diepenbeek:
Agoralaan Gebouw D | 3590 Diepenbeek

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COVID-19

This master thesis was written during the COVID-19 crisis in 2020-2021. This global health crisis might have had an impact on the (writing) process, the research activities and the research results that are at the basis of this thesis.

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Abstract

Background: Biodiversity has declined dramatically over the years. This decline can be caused by several drivers, such as natural causes or human activity. In order to find solutions to prevent or restore biodiversity losses, the non-use value needs to be determined which can be expressed by the willingness to pay (WTP). As there is limited information about this WTP and what it drives, this paper will explore the differences in WTP of respondents considering the prevention and/or restoration (=*scenario)* of a fire. That specific fire can be caused by a natural cause, natural and human unintentional climate change, a human unintentional and intentional cause.

Method: Using double-bounded dichotomous choice contingent valuation, the impact of different variables on the WTP will be analyzed. The mean WTP values per scenario and cause were calculated by a double-bounded regression model and the differences between the WTP values were compared using an independent sample t-test with equal variances.

Review result/Synthesis: Ten different regression models were established using data from 308 respondents from an online survey in order to obtain influential variables.

Conclusion: Overall, there is no significant difference visible between the WTP values of prevention and restoration, and both scenarios separately. In this way, no conclusion can be made regarding the WTP for different causes of a fire. We were able to conclude that human-induced losses are considered more serious in comparison with the same losses resulting from natural causes. Respondents feel most responsibility for a human unintentional cause due to climate change, followed by a human intentional cause.

Keywords: biodiversity, willingness to pay, non-use value, causes

1 Introduction

In recent years, biodiversity, the variety of living organisms on our planet, has declined dramatically (European Parliament, 2020). In Europe alone, at least 1.677 of the 15.060 species investigated are threatened by extinction due to both natural and human causes of biodiversity loss, and not only the variety in animals, but also the variety in vegetation deteriorates over the years (European Parliament, 2020). The losses in biodiversity are problematic due to the fact that we need healthy ecosystems that provide essential services that we take for granted. Biodiversity supports the provision of clean air, fresh water, medicines, food security and on

top of that it also helps to combat and adapt to climate change and reduces the impact of natural disasters (European Parliament, 2020; World Health Organisation, 2005). Through the decline of biodiversity, ecosystems are at risk, whereby more than 1 billion people around the world have no access to safe water supplies. Due to the lack of safe water supplies, microbial contamination of drinking water occurs, which takes 3.2 million lives each year, this is about 6% of all mortality worldwide (World Health Organisation, 2005). Another interaction of biodiversity and well-being is that worldwide 25% of medicines are developed with plants from the rainforest and 70% of cancer medicines are nature inspired. Thus, every time a species becomes extinct, there are fewer new medicines that can be developed (Quinney, 2020). The biodiversity losses are caused by multiple drivers, or causes, whereby human activity such as changes in land use, pollution and climate change is the main cause (Sharman & Mlambo, 2012; European Parliament, 2020). According to the World Wildlife Fund (WWF), 80% of global deforestation is caused by agriculture. In addition to this, drivers related to food production, i.e. where and how food is produced, are responsible for 70% of biodiversity loss on land and 50% of biodiversity loss in freshwater (WWF, 2020). Similar results can be found following Mantyka-Pringle, Martin & Rhodes (2012), habitat fragmentation and overharvesting in combination with environmental warming resulted in a decline of the rotifer zooplankton population up to 50 times faster. Considering land bird species, between 950 and 1.800 species of the world's 8.750 existing ones, could be imperiled by climate change and land conversion by the year 2100 (Mantyka-Pringle et al., 2012). Besides human activity, natural activities, like floods, earthquakes, or wildfires, can also cause biodiversity losses (World Health Organisation, 2005; Kilinc, Yeşiltaş, Kartal, Demiral & Eroğlu, 2013). In America, the frequency of large wildfires has increased by nearly four times in the period 1987 to 2003, while at the same time bark beetle damage has reached unprecedented levels. A similar trend is evident for wildfire, windthrow, and bark beetles in Europe. This trend is likely to continue in the future as a result of the climatic changes expected for the upcoming decades (Thom & Seidl, 2015).

To diminish the decline of biodiversity, different solutions can be implemented for restoring or preventing these losses, such as planting new trees, plants and flowers or cultivating threatened species (Kilinc et al., 2013). To gain insight into the amount that people are willing to pay for preserving or restoring a specific landscape or area, the non-use value for biodiversity conservation is an important factor. The reason is that people do not have to use biodiversity itself in order to obtain the non-use value, but they can derive this value from the understanding

of biodiversity existence and its preservation for others (both current and future generations) (Nobel et al., 2020b). Since human activity is the most frequently occurring cause, which threatens the stability and continuity of ecosystems as well as the provision of goods and services to humans, it is interesting to determine what people are willing to pay to reverse their actions (Nunes & van de Bergh, 2001). According to Bulte, Gerking, List and Zeeuw (2005), the WTP of people depends on the cause, human- or nature-related, that lies at the origin of the loss of biodiversity. Therefore, to indicate the importance of biodiversity to human well-being, it is essential to know the WTP for biodiversity, which can contribute to the realization of prospects that the EU should protect 30% of natural areas by 2030 and degraded ecosystems should be restored (European Parliament, 2020). Above that, the WTP is important to maintain or enhance beneficial contributions of nature to a good quality of life for all people (Díaz et al., 2018). In order to do a monetary valuation of biodiversity, the total economic value (TEV) can be seen as an important framework. The TEV consists of the use value and non-use value. To determine the WTP, the non-use value is used in this study (Laurila-Pant, Lehikoinen, Uusitalo & Venesjärvi., 2015).

Previous studies have already examined the effect of different causes on willingness to pay. For example, Bulte et al. (2005) examined the impact of human or natural causes on the willingness to pay for protecting seals. Also Kahneman, Ritov, Jacowitz and Grand (1993) examined if the cause (human or natural) of a harm affects the WTP of respondents to prevent or restore the harm. However, both studies did not investigate the differences between the different types of human and natural causes, such as a human intentional or unintentional cause. On top of that, they did not examine whether there was any difference between the WTP values of preventing or restoring the described problem. A third similar study was performed by DeKay and McClelland (1996) in which they investigated people's beliefs about the relationships among species' attributes in order to determine how these attributes are linked to people's expressed values for endangered species (Dumitras et al., 2017). With our research, we want to close the gap in literature about the impact of different causes on the WTP to prevent and/or restore biodiversity loss.

This master thesis will assess the WTP for reductions of biodiversity losses in public areas using a contingent valuation method, i.e. dichotomous choice modeling. More specifically, it quantifies the amount that people are willing to pay to recover, to the extent possible to ensure that the damage is minimized, or prevent these losses, with a distinction being made between

various causes. Hence, both human- and natural causes will be included. This research will consider the WTP for both the recovery and prevention of biodiversity loss based on several factors. The WTP for recovery is recorded as it is easier for people to determine how much they are willing to pay if they experienced the incurred damage in real life. However, a disadvantage of the WTP for restoring biodiversity is that the government in real life only can collect money once the damage actually has suffered. The reason that this research will also focus on the WTP for preventing biodiversity losses, is to make differences visible between the effective occurrence and possible occurrence of a scenario and their impact on the WTP. The focus of this study will be on the Blue Forest due to its rich biodiversity and attractive appearance, which consists of varying topography and a continually changing landscape (Rijck et al., 2018). This location is very unique due to the large amount of hyacinths found in one place, which colors the forest with blue and purple flowers that are flowering in the months of April and May. In addition to the hyacinths, the forest is also known for its sequoia trees, which have survived the world war, but the forest also features many other species of plants and flowers. The surface area of the Blue Forest is 542 hectares and is freely accessible for visitors, which makes it a good location to use for the survey about the WTP for biodiversity losses.

This leads us to the central research question 'Does the non-use value of biodiversity loss depend on the cause?'. Underlying research questions are: 'What is the willingness to pay for natural caused biodiversity losses?', 'What is the willingness to pay for human caused biodiversity losses?' and 'What is the difference in WTP to restore or to prevent losses?'.

To collect the data, the contingent valuation method will be used, more specifically a double-bounded dichotomous choice contingent valuation. In this method, respondents will be asked if they are willing to pay €X to restore or prevent biodiversity losses at the Blue Forest. After this question, there will be follow-up questions to make sure our results are as close as possible to what the participants are actually willing to pay. To analyze the double-bounded dichotomous choice contingent valuation, we will use the maximum likelihood, under the assumption of normality (Hanemann, Loomis & Kanninen, 1991). This way, we would like to gain insight into respondents' WTP depending on the scenario and the associated causes, and to examine the differences in WTP.

The remainder of the paper is structured as follows: in Section 2, an explanation will be given concerning biodiversity, its importance and how it can be valued. Here, related literature about

the WTP depending on the cause will be discussed. These methodologies will be used to support claiming the gap in literature. Section 3 describes the method and data used. Section 4 shows different regression models based on the nature of conservation (prevention or restoration) and the causes (human- and natural causes). Section 5 concludes with a discussion. In Section 6, recommendations for further research will be given.

2 Literature study

In this section, relevant concepts of biodiversity, biodiversity loss and its causes will be defined, and some of its important aspects will be clarified. Subsequently, the relationship between the cause and the willingness to pay will be addressed. Some hypotheses will thereby be formulated which will be either rejected or not rejected based on the results of an empirical study.

2.1. What is biodiversity?

Biodiversity is an umbrella term for the variety of different living organisms (Rawat & Agarwal, 2015). Biodiversity is important for its intrinsic value, but also because it delivers and sustains a wide range of benefits that contribute to people's well-being and livelihoods (Christie, Fazey, Cooper, Hyde, & Kenter, 2012). However, as several studies have consistently reported, biodiversity is declining at an unprecedented rate and human pressure on ecosystems is among the contributors to this decline (Galli, Wackernagel, Iha, & Lazarus, 2014). In a more restricted interpretation, biodiversity can be approached in four different levels (figure 1). Genetic biodiversity is seen as the base level. This level refers to the variety of genetic information within species. A second level is species biodiversity; this refers to the diversity of all living organisms that have been listed before (Rawat & Agarwal, 2015; Nunes & van den Bergh, 2001). The third level encompasses the biodiversity of ecosystems; this level covers all the different habitats on earth where an organism can live, from tropical rainforests or savanna, but also forests, grasslands, wetlands or deserts (Verma, 2016; Kumar, 2012). Functional diversity can be seen as the last level of biodiversity. According to Petchey and Gaston (2006), functional diversity is a subset of biodiversity that addresses the different sorts of things that organisms do in both communities and ecosystems (Petchey & Gaston, 2006).

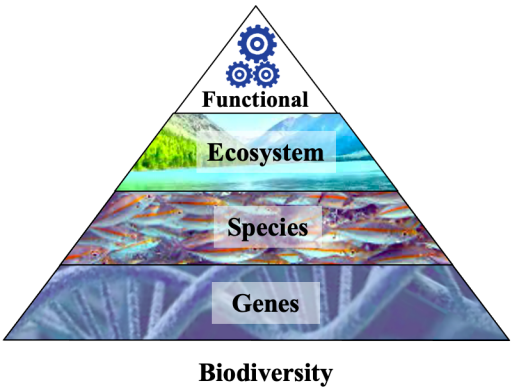

Figure 1: Biodiversity levels (based on Thorne-Miller (1991))

According to Rawat and Agarwal (2015), biodiversity has some utilitarian benefits, because biodiversity offers a wide set of productive materials, ranging from food, medicines to industrial raw materials. For the consumption of food, humans have been using more or less than 7.000 different plant species and over 200 million people use wild species as their food. Not only are plants used for food consumption, also more than 70.000 different plants are used for the production of medicines. To ensure that everything remains available, biodiversity is important due to the fact that it has an essential part in the functioning of ecosystems and what they provide. If there is a loss in biodiversity, the environment will experience changes that will have an impact to human life. However, this biodiversity loss, the distorted ecosystems, and declining species, is in nearly all cases caused by human hand (Rawat & Agarwal, 2015).

Biodiversity loss is already a common occurrence, following the Global Biodiversity Outlook 3-Convention on Biological Diversity, also called GBO-3, published in 2010, 31% of biological species living on earth have become extinct. Therefore, it is important to establish preservation and management measures to cope with the reduction of species (Lee, Lee & Lee, 2014). In order to determine the importance of biodiversity, the non-use value can be examined to gain insight in the willingness to pay depending on different causes of a fire. With the willingness to pay, precautionary measures can be taken to prevent a possible fire or to restore the site after a fire has occurred.

2.2. How and why value biodiversity in monetary terms?

Governments are striving to counteract biodiversity losses by introducing policies, such as e.g. reducing the risk of arson (Nobel et al., 2020a). An important way to assess the benefits of

conservation policy, is to estimate monetary values of biodiversity and the related ecosystem services. Gaining awareness of the monetary value of biodiversity and ecosystem services and integrating them in policy formulation, therefore appears fundamental to assure more equitable and sustainable policies (Christie et al., 2012). It is essential for these policymakers to understand the value that people attribute to the biodiversity to which the policy measure applies, since the decline in biodiversity is for the most part the result of socio-economic and political pressures (White, Bennett, & Hayes, 2001). This valuation consists of two forms, the use value and the non-use value (Nobel et al., 2020a). The use value is the category of benefits that people derive from actual physical use of biodiversity (Wattage & Mardle, 2007). The non-use value, on the other hand, is relevant for determining the total economic value (TEV) of biodiversity preservation and reflects the benefits that people gain from the thought that biodiversity will remain in existence for current and future generations, without making any use of this biodiversity (Marre et al., 2015; Pearce & Turner, 1990). Therefore, by calculating the non-use value, the aforementioned more equitable and sustainable policies for biodiversity loss, can be determined. The preferences of users and non-users will vary according to the perception if the shifts in public goods are the consequence of human activities (Nobel et al., 2020a; Nobel et al., 2020b).

In order to examine the non-use value, the contingent valuation method can be used. Contingent valuation offers in first place flexibility as it is capable of capturing all components of TEV including non-use values. Secondly, it allows the valuation of environmental changes that have not yet occurred. Thirdly, it provides a full socio-demographic profile of the target population.Fourthly, it allows contingent scenarios to be designed to directly elicit the value of the change under scrutiny and lastly, it allows a better alignment of public expectations and political initiatives as the valuation process is submitted to public discussion (Ressurreição et al., 2011). The TEV of a natural resource is the sum of its direct, indirect, option and existence values (figure 2). Direct value is related to the direct use of the resource, whereas indirect use value is associated with benefits that individuals experience indirectly, or as a consequence of the primary function of a given resource. Option values on the other hand refer to all use values, both direct and indirect, that can be realized at some point in the future. Finally, existence value is the most elusive among the types of value noted. It can be seen as the non-use value in nature, but there are many fundamentally distinct perspectives (Torras, 2000).

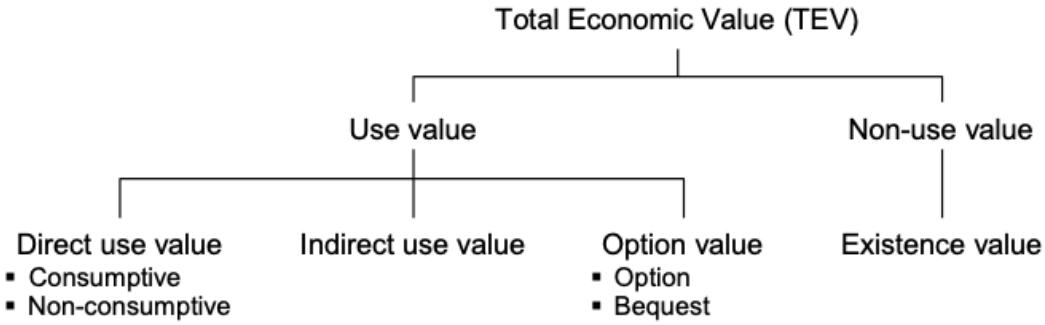

Figure 2: Components total economic value (TEV) (Pagiola, Ritter & Bishop, 2004)

This paper will apply the contingent valuation method which can provide meaningful insight into the economic value of biodiversity (Arrow et al., 1993). Contingent valuation is one of the most accepted methods for assessing the TEV of species, because it offers distinct advantages over measurement in the form of health state utilities (Garrod & Willis, 1997; Whynes & Sach, 2007). It is a useful instrument to determine what the broader community may be willing to pay for the preservation and enhancement of biodiversity, even if only for the awareness and satisfaction of its existence and its transmission to later generations (Garrod & Willis, 1997). It is considered as the more appropriate method for evaluating the non-market value of goods, such as health status and air quality that cannot be traded in the marketplace (Vassilopoulos, Avgeraki, & Klonaris, 2019). Another method which can be used to assess the components of TEV, is choice modeling. Choice modeling is used to identify the drivers of choice, to identify the relative impact of each of these drivers and to determine what affects choices specifically. Using these models, human choice can be predicted in many contexts (Khushaba et al., 2012). When stated choice modeling is used, respondents need to choose their preferred option from a set of alternatives with particular attributes. Contrary to this, contingent valuation methods will ask respondents directly their WTP for a specified service (Pagiola et al., 2004).

2.3. What is the relevance of causes for these values?

2.3.1. Biodiversity losses and its causes

Biodiversity on earth has gained more and more attention in the last few years due to its rapid decline. Through this decline, various animal and plant species are endangered with extinction. Globally, it is estimated that human land use has ensured that, on average, 13.6% of the various species of animals and plants have disappeared compared to pristine biodiversity (Newbold,

2018). For Europe, with a total area of 5.759.321 km^2, there is only 15.6% untouched land, i.e. areas where human activity has had little or no influence (Hens & Boon, 2005). In addition, 64.9% of Europe is dominated by humankind, through agriculture and urbanization, which has caused the disappearance of primary vegetation. A study from Pilotto et al. (2020), conducted for Europe, reveals that there is a meaningful decrease in the abundance of invertebrates on land. More specifically, it examined the three variables: changes in species richness, diversity, and turnover trend. Examining the turnover trend, i.e. measuring temporal community variability is important to monitor biodiversity because these trends are based on the presence and absence of species and reflect the rate at which these species are replaced (Pilotto et al., 2020; Yuan et al., 2016). For plants, the research concluded that turnover trends increased significantly.

Several research scientists have used models to predict that the extinction of various species is likely to continue to occur. An increasingly prominent factor is anthropogenic climate change (Nobel et al, 2020a). There is still a considerable uncertainty about the preceding forecasts since other literature suggests that climate change may also contribute to an increase in biodiversity. Due to climate change, species can expand and migrate to other new habitats which benefits biodiversity (Newbold, 2018; Warren et al., 2013).

2.3.2. Perception of climate change in Europe

In order to get a realistic understanding of what people's perceptions of climate change are nowadays, a survey was conducted by the European Social Survey (ESS) across Europe to capture people's beliefs (ESS, 2016). The data set used for this master thesis to obtain more information, was retrieved from the website of ESS. For this research, the focus was not on all of Europe, but only on Belgium, Germany, Spain, France, Great Britain, Italy, and the Netherlands.

First, the data concerning the question ‘Is climate change caused by natural processes, human activities or both?’ is analyzed. In the figure below (figure 2), the outcomes are given. For Belgium, Germany, Spain and Italy, people consider that climate change is mainly caused by human activity. Although in all these countries there is also a large number of people who think that both natural and human activity have a cause in the changing climate. The opposite situation applies in France, Great Britain, and the Netherlands. More specifically, people in these countries believe that climate change is mainly caused both by humans and nature.

Hereafter, humans are chosen as the second most causative factor. It is remarkable that for all seven countries, very few votes go to the fact that climate change is caused by natural processes alone. When all the responses of those countries are added together, it can be concluded that most of the people think that humans are mainly the cause of climate change, followed by the equal division between the natural processes and human activities.

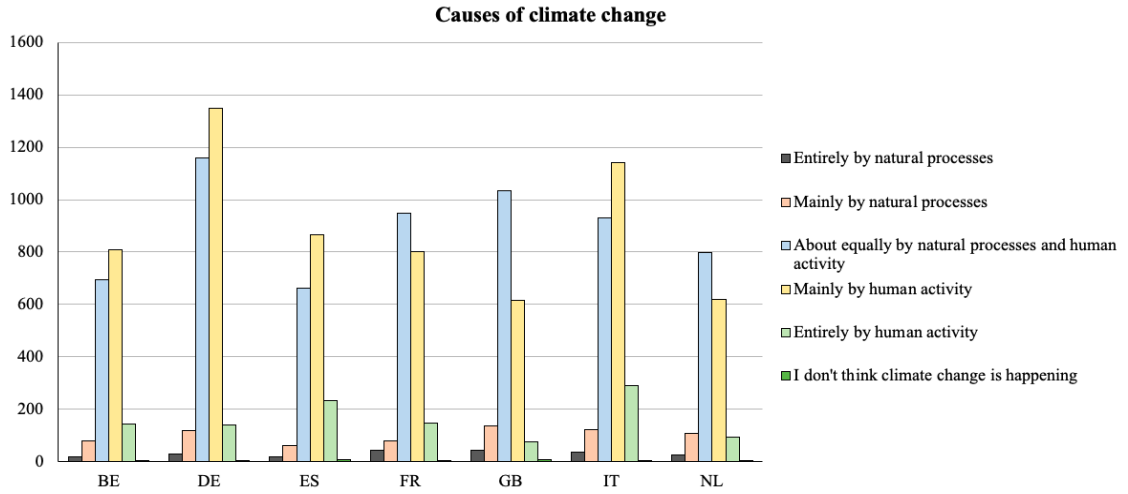

Figure 2: Causes of climate change (based on ESS (2016))

After analyzing people's beliefs about the cause of climate change, the impact of climate change on the included countries is examined, these results can be found in figure 3. The people surveyed in Belgium, Germany, France, Great Britain and the Netherlands do believe that climate change is having a reasonably bad impact on earth. For both Spain and Italy, most people are convinced that there is an extremely bad impact. Only a limited number of people from these seven countries believe that climate change is having an extremely positive impact on the world.

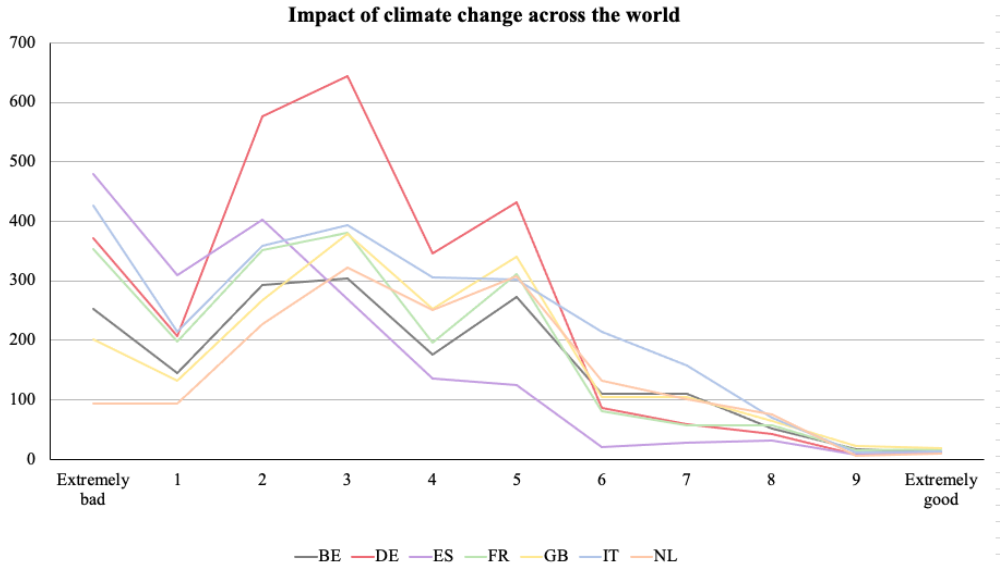

Figure 3: Impact of climate change across the world (based on ESS (2016))

Figure 4 illustrates the extent to which respondents are concerned about climate change. For all countries, except Spain, people are somewhat concerned about climate change today. In Spain, however, people are very concerned about this worldwide problem and only a fraction of respondents do not worry at all about climate change.

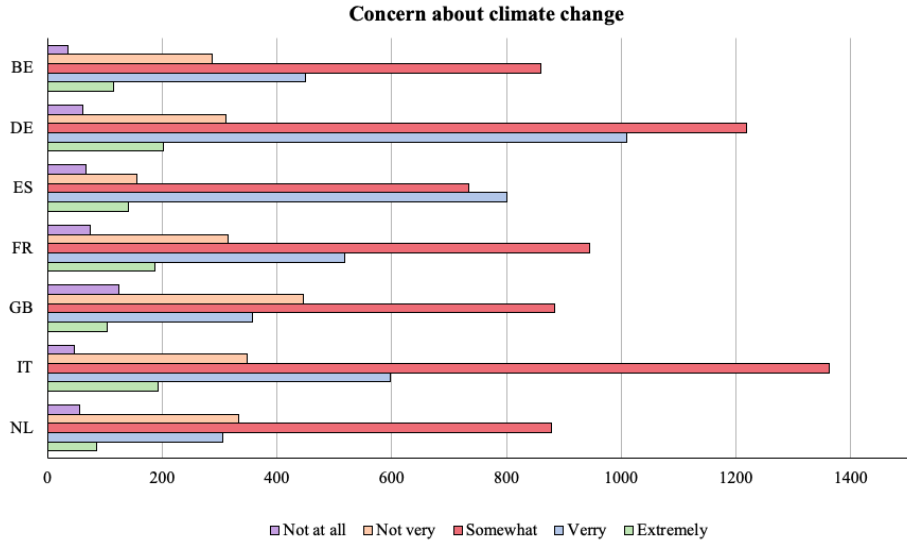

Figure 4: Concern about climate change (based on ESS (2016))

Finally, data on the responsibility of the people surveyed to reduce climate change are analyzed. Every country, except Italy and Great Britain, showed that the respondents felt very responsible

to reduce the changes in the environment. In Italy this responsibility was only moderate. The results of this analysis can be found in figure 5 below.

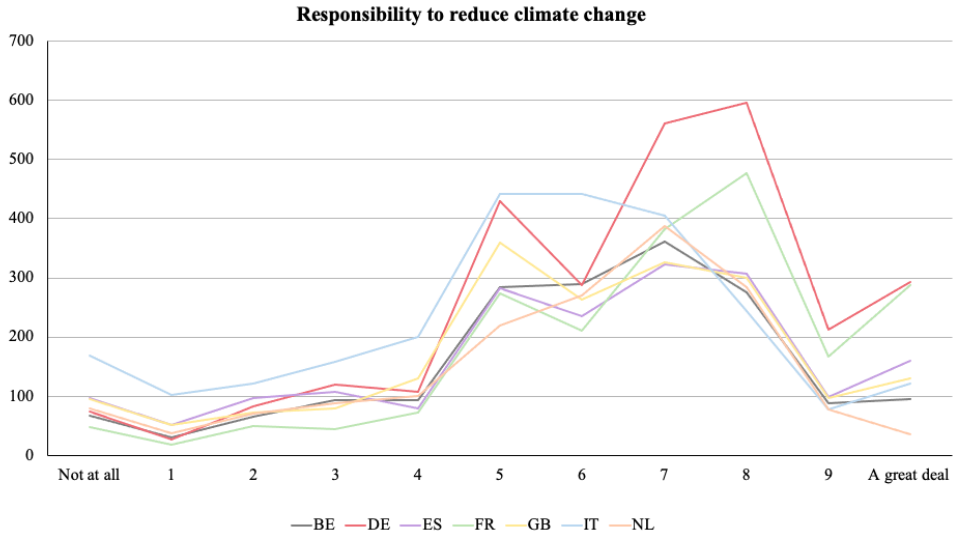

Figure 5: Responsibility to reduce climate change (based on ESS (2016))

Based on this, it can be concluded that people in the sampled countries have similar opinions. First of all, people believe that climate change is mainly caused by human activities and that the impact of these changes are between reasonably bad and very bad. Second, the population feels somewhat worried about the climate change that affects the world, but their sense of responsibility to reduce climate change is fairly high.

As mentioned before, the loss of biodiversity is a worldwide concern. Major biological causes of biodiversity loss are habitat destruction and fragmentation, the appearance of exotic species and the homogenization of agricultural varieties. The rate of extinctions might be accelerated due to other causes such as overexploitation, climate change, habitat deterioration and extinction cascades. These potential sources can be associated with a common denominator, e.g., they all have a human cause (Hens & Boon, 2005; Krauss et al., 2010).

Not only mankind is a cause of biodiversity loss, there are also natural causes such as seasonal changes. Natural causes for the loss of biodiversity are wildfires, floods, and volcanic eruptions. These factors are drastically changing the ecosystems through the elimination of local populations. A solid difference between human and natural causes is that the latter are

often more temporary due to the fact that they occur more regularly, and the ecosystems are modified to accommodate them (Rafferty, 2019).

2.3.3. Willingness to pay versus the causes of biodiversity loss

The economic theory shows that utility depends on outcomes and not on causes. However the willingness to pay of people may violate the previous assumption in two different ways. Firstly, Bulte et al. (2005) explained that intentional harm is considered more upsetting than unintentional harm. More specifically, their research confirmed that people are willing to pay significantly more to correct problems caused by humans than by nature itself, this is referred to as the outrage effect. Secondly, Brown, Peterson, Brodersen, Ford and Bell (2005) mentioned that respondents consider human-induced losses to be much more serious in comparison to the same losses resulting from natural events. Hence, it can be concluded that the utility depends on causes.

When it was studied how disparity between the willingness to accept (WTA) and the willingness to pay (WTP) is affected by the cause of an environmental problem, they concluded that the disparity can be described as the WTP to be the conservative estimate (Bulte et al., 2005). When the disparity between WTA and WTP is not considered, but rather the cause on which WTP is based, the study of Bulte et al. (2005) describes that the WTP to undo harm caused by humans is lower compared to the WTP caused by natural damages.

Brown et al. (2005) states that the cause of the loss does not affect the value of the lost object generally. A similar principle would hold for environmental losses. Yet it is becoming clear that people's evaluations of losses are affected by more than just the magnitude or consequences of the loss. They found that when natural events are the cause of environmental damage, the provoked sense of violation, or sense of responsibility, is certainly lower than when human actions are at the basis of the loss. This states that people feel different emotions by the different causes (Brown et al., 2005). Seriousness of human-caused loss correlates positively with the strength of feeling that someone should pay for restitution (Brown, Nannini, Gorter, Bell, & Peterson, 2002). If respondents feel free from responsibility, when someone else is to blame, they will have lower WTP values (Walker, Morera, Vining, & Orland, 1999). The WTP is thus driven by the degree of responsibility that people feel for the damages and therefore the nature of the threat (Bulte et al., 2005). The more personally responsible a person feels for loss or damage to a commodity, the more Walker et al. (1999) expects a person to be

willing to pay to restore that commodity. Thus, collective guilt mediates the effects of beliefs about the cause and effect of global warming on willingness to participate in mitigation. When people believe that their group is responsible for harming the natural world and that the damage can be repaired, their feelings of collective guilt are likely to elicit behaviors to repair the harm done (Ferguson & Branscombe, 2010).

Following Brown et al. (2005), there are five essential conditions for assigning full responsibility for a loss. The first condition is that there needs to be a clear causal link from the person or group of persons performing the act to responsibility for the act, in other words, the responsible group or person can be identified. Secondly, there may not be any compulsion while executing the action. Thirdly, there needs to be awareness of the likely consequences of the act. It also requires the intention to act so. Lastly, a generally recognized obligation to act otherwise has to be involved. None of these conditions are met when the losses are caused by nature, unlike illegal actions that fulfill all the conditions.

2.3.4. Hypotheses

The hypotheses of this study are derived from the aforementioned paragraphs. The first hypothesis is to find the amount that people are willing to pay to recover or prevent the loss of biodiversity, whereby a distinction is made between the various causes. There will be five different causes that are being analyzed, namely a natural cause, natural and human unintentional climate change, a human unintentional and intentional cause. For each WTP, it will be examined what factors underlie this, such as the sense of responsibility that Brown et al. (2005) described, and whether these amounts are different based on the underlying cause. In this way, the following hypotheses can be formulated.

Hypothesis 1:	**Hypothesis 2:**
H_0: $WTP_{h,i} = WTP_{h,j}$	H_0: $WTP_{Prevention,i} = WTP_{Restoration,i}$
H_1: $WTP_{h,i} \neq WTP_{h,j}$	H_1: $WTP_{Prevention,i} \neq WTP_{Restoration,i}$

Whereby 'h' stands for prevention or restoration, 'i' for one cause and 'j' for another cause different from cause 'i'.

Hypothesis 1 will form an answer to the central research question 'Does the non-use value of biodiversity loss depend on the cause?'. Whereas the aforementioned hypothesis 2 will

generate an answer on the underlying question if there is a difference in the WTP of people to restore or to prevent these losses.

3 Method

3.1. Contingent valuation method

As the contingent valuation method (CVM) is one of the standard approaches for valuing non-marketed resources, such as wildlife and environmental quality, it was the chosen method in order to estimate the non-use value (Hanemann et al., 1991). There are some representative elicitation formats included in the CVM like open-ended questions, bidding game, payment cards or dichotomous choice (Aikoh, Shoji, Tsuge, Shibasaki, & Yamamoto, 2020). The dichotomous-choice format was used in the established survey as it is the most widely used format at present. Hereby, respondents were asked closed questions about their WTP, but also open questions in order to obtain their maximum WTP value. This format was chosen as the biases that occur in other formats, such as starting point bias and range bias, do not occur in this format. It also avoids bias arising from the strategic behaviors of respondents under certain conditions. Respondents find it easy to answer questions presented in this format, because judging whether to accept the cost of achieving the environmental change is similar to daily purchasing behavior of judging whether to buy goods with a specific price (Aikoh et al., 2020).

The double-bounded format is preferred over the single-bounded format as this is statistically more efficient and the confidence interval of the estimated WTP is narrower (Hanemann et al., 1991). Here, respondents need to answer two consecutive questions. If the respondent accepts the initial amount (=*bid1*) at the first step, they are presented with a higher amount (=*bid2*) in the second step. If respondents do not accept the initial amount, they are presented with a lower amount (=*bid2*) in the second step. This way, more information is obtained using the double-bounded format than in the single-bounded format, which asks only one question. As a consequence, a smaller number of respondents are needed to estimate the WTP compared to the single-bounded format (Aikoh et al., 2020). To avoid truncated data, a follow-up open-ended question assessed respondents' maximum WTP by asking them to specify the maximum amount they would be willing to pay, between the previously accepted bid and the refused bid (Loubiere et al., 2019). To analyze the double-bounded dichotomous choice contingent valuation, we will use the maximum likelihood, under the assumption of normality to estimate

the coefficients (Hanemann et al., 1991). The data that is collected through this method can be seen as categorical data, as each respondents' WTP can be subdivided into one of the four categories, namely 'no-no', 'no-yes', 'yes-no' and 'yes-yes' (Kanninen, 1993).

3.2. Survey design

The data to formulate an answer to the research questions is collected using a survey. This survey focused on the determination of the willingness to pay of respondents for the restoration or prevention of a fire on a natural site that people can visit, more specifically The Blue Forest in Belgium.

The survey considered five different causes of afire: a natural cause, a natural cause due to climate change, a human unintentional cause caused by climate change, a human unintentional cause, and a human intentional cause. In this way, it can be tested if the willingness to pay of respondents varies when the naturalness of the pressure described in the scenario differs. The payment vehicle used in this survey is a one-time donation in monetary terms. In the established survey, the first question asked each respondent was if they were willing to donate individually a one-time amount of €30 (= *bid1*) to restore/prevent biodiversity loss from a specific cause for a time period of five years. Based on the answer to this question, they were either asked if they wanted to donate once €15 or €45, these response options will be denoted as *bid2*.

In the survey, before starting a new cause, an introduction was given to inform the participants. Participants were randomly assigned to one of the two possible scenarios, namely restoration or prevention. In addition to the randomization of the scenarios, also the five different causes were displayed in a randomized order to avoid any form of bias because of the order of the causes. Besides asking questions about the amount respondents are willing to donate to prevent or restore biodiversity loss due to a fire, they were also asked some emotional questions. These questions included the extent to which the respondent was responsible for the biodiversity loss and the extent to which they were affected by it. In addition, they were asked to what extent this would occur in reality, how seriously they find the losses and if they already knew/visited the Blue Forest. The ordinal measurement level is used to measure the value of the questions reflecting the responsibility, affection and reality on a five-point Likert scale, which means that they are categorical variables. The survey was finalized with demographic questions such as the respondent's *gender* and *age*, as well as *income*, *highest degree*, *financial security* and *work*

security. The latter two variables are dichotomous variables, and the other four variables are categorical with respectively four, seven, seven and six categories (= dummy variables). The entire survey can be consulted in appendix A.

3.3. Data collection

Due to the circumstances of COVID-19, data was obtained by distributing this survey on social media, such as Facebook, Instagram and LinkedIn. In the introduction of the survey, photos of the Blue Forest were presented to respondents to make it as realistic as possible for the respondents who did not know this forest. Both visitors and non-visitors of the site were able to participate in the survey to make sure the results are as representative as possible.

A total of 308 respondents fully completed the survey in which there were slightly more respondents (n = 159) who received the survey on restoration, compared to those (n = 149) with the survey on prevention. There was also some data cleaning before the analyses were conducted. If the respondent was not willing to donate *bid1* and *bid2*, so in other words answered twice 'No' on the double-bounded dichotomous questions, an additional question about the reason behind this response was asked in order to locate protestors. Respondents who preferred not to pay for any reason other than 'not being able to pay' were considered to be protestors and were therefore not included in the analyses of the WTP. Some reasons that respondents did not want to pay for restoring or preventing biodiversity caused by a fire were: "I do not wish to donate for this, but want to contribute to nature management in a different way.", "I already support a different nature organisation." and "I believe that the government is responsible for nature management.". The number of protesters per scenario and cause is shown in table 1.

Table 1: Number of protestors

Number protestors prevention	Number protestors restoration
Natural cause	
68	68
Natural climate change	
75	65
Human unintentional cause	
104	89
Human unintentional climate change	
79	69
Human intentional cause	
114	103

3.4. Statistical analysis

3.4.1. Double-bounded regression model

Quantitative analyses will be carried out in the statistical analysis tool STATA to formulate an answer to our research question based on the generated data. Here, the intention is to estimate different regression models to measure the non-use value of biodiversity. There will be generated ten different double-bounded regression models, whereby these models will differentiate depending on the scenario (prevent or recover) and the different causes namely, a natural cause, natural or human unintentional climate change, a human unintentional cause and a human intentional cause. However, these different models will consist of the same demographic variables, which will be addressed further below. These regression models will also use the same response options for the double-bounded questions to increase comparability.

The ten regression models are formed using equation (1). The willingness to pay to restore or prevent a fire (Y) is expressed in terms of several socio-demographic variables, such as dummy variables for the age-categories, whereby the category '26-35 years' (*AGE3*) is excluded due to the dummy variable trap. Also if the respondent feels financially comfortable

(*FINANCIALLY_COMFORTABLE*) and if the respondent has work security (*WORK_SECURITY*) are calculated for. The reason that the impact of respondents' age is included, is because a previous study from Haab & Hitzhusen (2007) indicated that the age of respondents has a negative impact on the WTP. However, for the other two variables, no previous studies could be found where these variables were included. In our study, these variables are included because we make the assumption that the more financially comfortable people are and the more work security there is, the higher the WTP is going to be.

Besides the socio-demographic variables there are also several emotional variables included per different cause such as how responsible the respondent feels about the specific cause (*RESPONSIBILITY*), how affected he/she is about the losses due to that cause (*AFFECTED*) and to what extent the respondent believes that this cause will actually happen in reality (*REALITY*). As with the variables *FINANCIALLY_COMFORTABLE* and *WORK_SECURITY*, no information was found in previous studies for these emotional variables as to what the potential impact on the WTP would be. Nevertheless, to gain insight into this, these variables are included in our study because we assume that the more responsible or affected respondents feel considering a fire or the more respondents think the fire can actually occur, the more they are willing to pay.

The last symbol in the equation below, u_i, represents the error term and indicates the uncertainty of our regression model.

Eq. (1): $Y = \beta_0 + \beta_1\ RESPONSIBILITY + \beta_2\ AFFECTED + \beta_3\ REALITY + \beta_4\ BLUEFOREST\_KNOWN + \beta_5\ AGE1 + \beta_6\ AGE2 + \beta_7\ AGE4 + \beta_8\ AGE5 + \beta_9\ AGE6 + \beta_{10}\ AGE7 + \beta_{11}\ FINANCIALLY\_COMFORTABLE + \beta_{12}\ WORK\_SECURITY + u_i$

As mentioned above, we will use the maximum likelihood to calculate the average WTP per scenario and per cause, whereby equation 2 below is used (Lopez-Feldman, 2012).

Eq. (2):
$$\sum_{i=1}^{N}\left[d_i^{yn}\ln\left(\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid1}{\sigma}\right)-\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid2}{\sigma}\right)\right)+\ d_i^{yy}\ln\left(\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid2}{\sigma}\right)\right)\right.$$
$$\left.+\ d_i^{ny}\ln\left(\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid2}{\sigma}\right)-\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid1}{\sigma}\right)\right)+\ d_i^{nn}\ln\left(1-\Phi\left(z_i'\frac{\beta}{\sigma}-\frac{bid2}{\sigma}\right)\right)\right]$$

In this equation d_i^{hk} are indicator variables that can take the value one or zero, whereby h and k can be defined as 'no' or 'yes'. The value of the indicator variable is depending on the respondents' case, i.e., if they answered 'no-no', 'no-yes', 'yes-no' or 'yes-yes'. The symbol Φ means that the standard cumulative normal is taken of the subsequent operation, whereby z_i' indicates a vector of the explanatory variables, β is a vector of parameters and σ stands for the standard deviation.

3.4.2. Comparison of WTP values for biodiversity losses due to a specific cause

After the willingness to pay was obtained for every scenario and cause, these values were subjected to a t-test for comparison. This way, we were able to test for significant differences between the different WTP values instead of the entire regression models. An independent sample t-test with unequal sample sizes and similar variances was chosen as it is more conservative compared to a z-test (Walpole, Meyers, Meyers, & Ye, 2014). The population averages are also not known, which ensures us to use the t-test following Walpole et al. (2014). For this t-test, the distributions that are compared have to satisfy certain assumptions. According to Rojewski et al. (2012), the first assumption is that each sample needs to be a random sample of their population. Secondly, the two distributions must be normally distributed. When this assumption is violated, Type I error rates are in most of the cases not impacted in a negative way. Type I errors occur when group differences are identified, i.e. real effects are determined, but do not really exist. A final assumption that needs to be satisfied is that the variances of the dependent variables within each group being analyzed need to be equal, also called the homogeneity of variance. When violated, Type I and Type II errors may occur which could result in an overestimation or underestimation of the true result. A Type II error refers to situations where real effects are present in the data, but are not detected by statistical analyses (Rojewski et al., 2012).

4 Results

4.1. Descriptive statistics

Our survey was fully completed by 308 participants, 126 participants were male, 176 participants were female, one gender neutral participant and two participants who rather not answered this question. Most participants (n = 133) were between 18 and 23 years old, lived in Limburg and are working. The majority of participants indicated they did not know the Blue Forest (n = 163). Only fifty participants who knew the Blue Forest, already visited it before

filling out the survey. To obtain a more comprehensive understanding of the data, a description of all the variables used is first given in table 1 below.

Table 2: Description of the variables

Name of the variable	Definition	Mean	Std. Dev.
Responsibility	This variable is indicated by respondents with a number between 1 and 5: 1 = not responsible for the biodiversity loss, 5 = very responsible.	2.033	0.933
Affected	This variable is indicated by respondents with a number between 1 and 5: 1 = not affected by the biodiversity loss, 5 = very affected.	3.324	1.087
Reality	This variable is indicated by respondents with a number between 1 and 5: 1 = unlikely that the cause will occur, 5 = very likely.	3.445	1.008
Blueforest_ known	Dummy variable indicated by the respondent: 1 = knowing the Blue Forest, 0 = not knowing the Blue Forest.	0.464	0.500
Age1 - Age7	Categorical variable which reflects the age that is indicated by the respondent: 1<= 18, 2 = 18 - 25 year, 3 = 26 - 35 year, 4 = 36 - 45 year, 5 = 46 - 55 year, 6 = 56 - 65 year, 7 => 65 year.	3.198	1.445
Financially_ comfortable	Dummy variable indicated by the respondent: 1 = financially comfortable, 0 = not financially comfortable.	0.854	0.354
Work_ security	Dummy variable indicated by the respondent: 1 = working security, 0 = no work security.	0.812	0.392

Further in this section, analyses are conducted in order to determine if the WTP of participants differ depending on the scenario and on the cause of the fire and whether there are significant differences present between the WTP of the different causes in prevention and restoration separately. Due to several high correlations, some variables are not taken into account, such as the highest diploma obtained by the respondent and how guilty they feel about the cause of the fire. But also the income of the respondent, as well as the highest degree and gender are not taken into account, because with these variables included, all ten models were not significant. As mentioned before, the dichotomous choice responses obtained, can be used to estimate a linear WTP function.

4.2. Regression results

Due to the fact that our survey contained two different scenarios and five different causes for biodiversity loss, we estimated ten different regression models. The regression results are presented in tables 3 and 4, where table 3 represents the results for prevention and table 4 contains the results for restoration. In these tables, the values between parentheses are the standard errors.

Table 3: Double-bounded regression models prevention

Prevention					
	Natural	**Natural climate change**	**Human unintentional**	**Human unintentional climate change**	**Human intentional**
Responsibility	2.366 (2.320)	7.676*** (2.621)	2.268 (2.204)	3.606 (2.920)	1.713 (2.981)
Affected	4.725** (2.177)	4.412* (2.484)	4.627 (2.845)	2.025 (2.770)	4.623* (2.634)
Reality	4.929* (2.573)	-1.473 (2.599)	2.621 (2.403)	1.055 (2.976)	4.448* (2.665)

Blueforest_ known	-3.494 (4.525)	-0.759 (4.695)	-3.297 (4.922)	4.633 (5.168)	-7.623 (5.162)
Age1	2.745 (10.117)	1.708 (10.010)	-3.812 (10.908)	7.673 (12.035)	-2.535 (11.596)
Age2	-4.979 (6.053)	-0.455 (6.263)	-8.717 (6.846)	-0.810 (6.723)	-15.404** (7.559)
Age4	0.918 (6.971)	6.220 (7.226)	4.670 (8.652)	4.628 (8.210)	-2.919 (8.633)
Age5	14.219* (8.018)	12.778 (8.226)	13.766 (8.943)	13.626 (8.729)	4.863 (9.414)
Age6	7.090 (9.270)	9.741 (11.648)	12.623 (11.182)	15.243 (12.053)	5.562 (14.438)
Age7	/(*)	/(*)	/(*)	/(*)	/(*)
Financially_ comfortable	15.023** (6.743)	19.623*** (7.423)	15.256** (7.396)	14.997** (7.387)	10.509 (8.390)
Work_ security	-10.540 (6.730)	-16.442** (7.357)	-2.362 (6.677)	-3.041 (7.080)	-7.928 (7.684)
Constant	-1.277 (13.510)	6.032 (12.754)	-4.547 (17.736)	0.495 (17.206)	9.767 (19.231)
Obs	108	99	80	97	69
Wald chi2	21.97**	24.19**	18.32*	13.52	18.59*
WTP (€)	38.46***	38.90***	34.56***	37.67***	38.14***

** p < 0.10, ** p < 0.05, *** p < 0.01*
(*) Omitted because of collinearity

From table 3 can be seen that all the regression models, except the model for the human unintentional climate change cause, are statistically significant. This means that at least one of

the predictors' regression coefficients is not equal to zero. When focused attention is paid to the predictors of the model, we see that there is no single variable that has a significant value for all five models of prevention. Only the variable *FINANCIALLY_COMFORTABLE* has a significant effect on the WTP for the natural cause, the natural climate change cause, the human unintentional climate change cause and the human unintentional cause. For these four models, it applies that the respondents are willing to pay more for the prevention of such a fire if they feel financially comfortable. Also the variable *AFFECTED* is significant in three of the five models, more specifically for the natural cause, the natural climate change cause and the human intentional cause. This means that considering these three models, people are willing to pay more when they feel more affected by the fire. It is remarkable that there are four variables (*BLUEFOREST_KNOWN, AGE1, AGE4, AGE5* and *AGE6*) that are not significant for any model. Therefore, no fully valid conclusion can be made here as to whether or not these variables have an effect on the WTP value. That the age of respondents does not have a significant influence on the WTP is not remarkable, because previous studies have obtained the same results. Only a research from Jeanty, Haab & Hitzhusen (2007) concluded that the variable *age* has a negative influence on the WTP. So, the more mature the respondent is, the less they are willing to pay.

Secondly, the focus will be on the restoration of the site after a fire happened. The results of the different causes considering the restoration can be found in table 4.

Table 4: Double-bounded regression models restoration

Restoration					
	Natural	**Natural climate change**	**Human unintentional**	**Human unintentional climate change**	**Human intentional**
Responsibility	2.251 (1.641)	2.313 (1.423)	1.323 (1.938)	-0.572 (3.951)	3.935 (2.509)
Affected	4.463*** (1.522)	3.758** (1.573)	2.810* (1.691)	3.951** (1.875)	4.599*** (1.669)

Reality	0.813 (1.722)	-2.550 (1.573)	-0.508 (1.986)	0.643 (1.829)	-1.478 (1.953)
Blueforest_ known	-1.603 (3.038)	-0.201 (2.915)	3.034 (3.802)	3.175 (3.382)	2.811 (4.017)
Age1	-4.360 (11.574)	-7.820 (10.134)	-5.330 (10.635)	-18.697 (11.846)	-7.797 (11.200)
Age2	-10.898** (4.343)	-11.114*** (4.172)	-18.518*** (5.468)	-11.070** (4.880)	-13.207** (5.386)
Age4	-6.823 (5.720)	-7.042 (5.848)	-14.845* (7.733)	-8.067 (6.683)	-0.160 (7.622)
Age5	-5.762 (5.141)	-3.622 (4.911)	-14.607** (6.468)	-5.298 (5.581)	-2.402 (6.223)
Age6	-5.666 (6.936)	1.759 (6.519)	-10.454 (9.309)	-1.067 (8.153)	2.634 (9.444)
Age7	-9.499 (14.051)	-6.901 (13.814)	-11.561 (16.123)	-6.413 (16.184)	-4.269 (14.760)
Financially_ comfortable	3.525 (4.497)	-2015 (4.517)	-5.792 (5.759)	0.821 (5.293)	9.578 (6.182)
Work_ security	1.814 (4.090)	1.314 (3.985)	6.760 (4.950)	2.409 (4.642)	-8.066 (5.823)
Constant	19.117** (7.642)	35.409*** (7.770)	37.558*** (9.974)	26.831*** (9.555)	22.360** (9.798)
Obs	103	105	88	104	71
Wald chi2	25.75**	22.53**	18.12	13.15	23.13**
WTP (€)	36.59***	35.94***	35.57***	36.62***	36.45***

** $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Based on the regression models in table 4, it can be concluded that both the model of the human unintentional cause and the model of the human unintentional climate change are not statistically significant. This also means in this case that at least one of the predictors' regression coefficients are not equal to zero. Variables *AFFECTED* and *AGE2* have a significant effect on the WTP of all the causes for the restoration of a site after a fire occurs. It can be concluded firstly, that people are willing to pay more when they feel more affected by the fire. Secondly, people of age category two, so between 18 and 25 years old, are willing to pay less for the restoration of a fire than people with an age between 26 and 35 years. This is not consistent with the aforementioned results of Jeanty et al. (2007) that states that if a person is older, they are willing to pay less. Considering these variables, it can be stated that the majority of the variables are not significant for any model. More specifically it is about the variables: *RESPONSIBILITY, REALITY, BLUEFOREST_KNOWN, AGE1, AGE6, AGE7, FINANCIALLY_COMFORTABLE* and *WORK_SECURITY*. As a consequence, there cannot be formed an overall conclusion whether or not these variables have an effect on the WTP value.

From the regression analyses, we can conclude that for both preventing and restoring biodiversity loss caused by a fire, there are very few factors in our study that have an impact on the willingness to pay. Remarkable results are firstly that for preventing biodiversity losses, in four of the five cases, the WTP of the respondents is influenced positively if respondents are financially comfortable, whereas the WTP for restoring biodiversity loss does not experience a significant impact of this variable. Secondly, it is remarkable that for restoring biodiversity losses, younger generations are willing to pay less, while there is no significant influence of age on the WTP for preventing these losses. Thirdly, the WTP for restoring biodiversity loss due to a fire is significantly dependent on how affected the respondents are by these losses, but for the scenario of prevention there is no significant impact of this variable on the WTP, except for biodiversity loss due to a fire caused by a human intentional cause.

4.3. Average willingness to pay values

The figure 6 below shows a summary of the values obtained from the regression analyses. As mentioned before, these amounts are what respondents individually want to donate on a one-time basis to prevent or restore biodiversity loss over the next five years. These results will be further compared in section '4.4. Comparisons of WTP values for biodiversity losses due to a

specific cause'. From our data, the conclusion can be reached that for every cause respondents are willing to donate more than €30 to prevent or restore biodiversity loss.

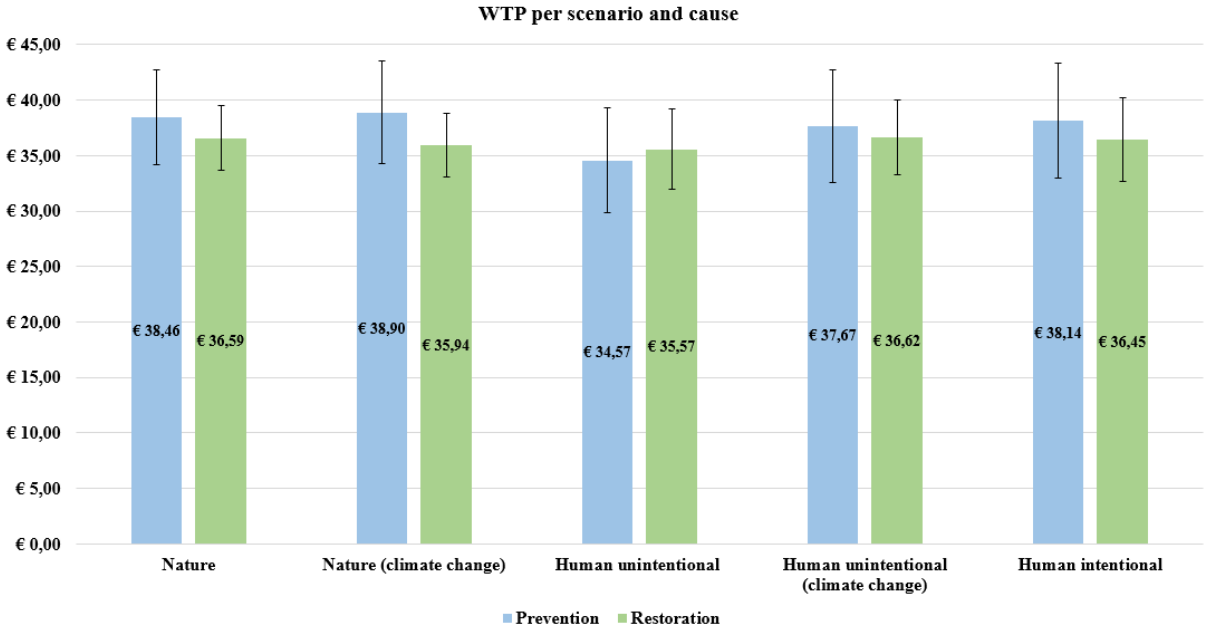

Figure 6: Summary WTP per scenario and cause with confidence intervals

Considering the results of prevention in figure 6, it can be concluded that the WTP is the highest looking at the results for the natural cause due to climate change and the natural cause, with a WTP of respectively €38.90 and €38.46. The lowest WTP is for the category of a human not intentional cause with €34.57. When comparing the different WTP for restoring biodiversity loss per cause, the highest WTP, with a value equal to €36.62, can be found for restoring the loss due to human unintentional climate change. The second highest WTP value is for diversity losses due to natural causes, with a WTP of €36.59. The WTP considering a human not intentional cause is the lowest category with a WTP of €35.57 for restoring biodiversity loss. However, after analyzing the differences between the WTP values, it can be concluded that there are no significant differences.

Because dichotomous choice modeling is used, the respondents can be divided into four groups based on monetary intervals where *bid1* is equal to €30 and *bid2* is equal to €15 or €45.

1) Respondent answered "No" to *bid1* and "No" to *bid2*: **€0 < WTP < €15**
2) Respondent answered "No" to *bid1* and "Yes" to *bid2*: **€15 < WTP < €30**

3) Respondent answered “Yes” to *bid1* and “No” to *bid2*: **€30 < WTP < €45**
4) Respondent answered “Yes” to *bid1* and “Yes” to *bid2*: **€45 < WTP < ∞**

Because previous studies concluded that the respondents' WTP for biodiversity losses can be impacted by how affected they are by the cause, how responsible they feel for the losses and how serious the losses are, the survey also contained some questions regarding the respondents' feelings on these variables. These results can be found in table 5 and 6.

Table 5: Mean results of respondents' affection by biodiversity loss due to a fire

Affected (prevention)	Mean	Affected (restoration)	Mean
Natural	3.134	Natural	3.151
Natural climate change	3.188	Natural climate change	3.094
Human unintentional	3.497	Human unintentional	3.289
Human unintentional climate change	3.295	Human unintentional climate change	3.195
Human intentional	3.812	Human intentional	3.585

When a linkage is made between both table 5, table 6 and figure 6, it seems that respondents were willing to pay more if they considered the cause to be more serious and if they felt more responsible for it. This conclusion is a confirmation of the studies of Brown et al. (2005) and Walker et al. (1999). There were 269 respondents who indicated that they considered a fire caused by a human intentional cause to be more serious than the other causes, and the WTP for preventing and restoring is also respectively €38.14 (third highest amount) and €36.45 (third highest amount). However, after performing an independent sample t-test with equal variances to compare the average WTP values, no significant results were obtained, so no conclusion can be made for the differences in average WTP. When examining the results of the responsibility of the respondents, it can be concluded that 149 respondents felt more responsible for the climate change caused by human interference. This confirms the research of Walker et al. (1999) as people were willing to pay more to prevent or restore biodiversity loss if they felt more responsible. In our study the respondents are willing to pay respectively €37.67 (fourth highest amount) and €36.62 (highest amount) for the cause they feel most responsible for, but as mentioned before, these differences are not significant which means that no conclusions can be made regarding the impact of the responsibility on the WTP.

Table 6: Seriousness of the cause of biodiversity loss and sense of responsibility for it

	Seriousness of biodiversity loss through a fire		Responsibility of biodiversity loss through a fire	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Natural	1	0.32	46	14.94
Natural climate change	6	1.95	9	2.92
Human unintentional	10	3.25	47	15.26
Human unintentional climate change	20	6.49	149	48.38
Human intentional	269	87.34	17	5.52
None	2	0.65	40	12.99

4.4. Comparisons of WTP values for biodiversity losses due to a specific cause

For the comparison of the WTP values, the average WTP values per specific cause, which are estimated using the regression models, are considered. In total, 25 different t-tests were performed that included two different causes each time as the assumptions mentioned in section '3.4.2. Comparison of WTP values for biodiversity losses due to a specific cause' were satisfied. In this way, a comparison will be made between prevention and restoration, and prevention and restoration separately.

In table 7, the results are given for the comparison between the different causes within the section of prevention and restoration. Thus, within prevention and restoration, each cause was compared with each other, in this way two times ten different comparisons were performed. With the use of the independent sample t-test with equal variances, the underlying differences were tested for significance. In this section, an answer will be provided to the first hypothesis 'Does the non-use value of biodiversity loss depend on the cause?'.

Table 7: Comparison between WTP of prevention and restoration

Comparison between WTP	T-value prevention	T-value restoration
Natural		
Natural climate change	-0.14	0.31
Human unintentional	1.18	0.43
Human unintentional climate change	0.23	-0.1
Human intentional	-0.06	0.06
Natural climate change		
Natural climate change	-0.14	0.31
Human unintentional	1.26	0.16
Human unintentional climate change	0.35	-0.30
Human intentional	0.21	-0.21
Human unintentional		
Natural climate change	1.18	0.43
Human unintentional	1.26	0.16
Human unintentional climate change	-0.86	-0.42
Human intentional	-1.00	-0.33
Human unintentional climate change		
Natural climate change	0.23	-0.1
Human unintentional	0.35	-0.30
Human unintentional climate change	-0.86	-0.42
Human intentional	-0.12	0.07
Human intentional		
Natural climate change	-0.06	0.06

Human unintentional	0.21	-0.21
Human unintentional climate change	-1.00	-0.33
Human intentional	-0.12	0.07

**Significant on 5% significance level*

To come to an overall conclusion about the WTP for preventing and restoring biodiversity loss from different causes, it can be stated that the differences in willingness to pay are not significant for all the twenty comparisons and that the first hypothesis is not rejected. As a consequence, it can be concluded that respondents are willing to pay an equal amount for the prevention or restoration of these losses independent of the cause of the fire, which is opposite to previous research. Firstly, the outrage effect cited by Bulte et al. (2005), i.e. that respondents are willing to pay more for human induced losses than for natural causes, is not confirmed with our study. Secondly, following the assumption from previous research by Walker et al. (1999), it was expected that the willingness to pay to restore the commodity will be higher when a person feels personally responsible for the loss or damage to a commodity. As there is no significant difference present regarding the restoration of biodiversity loss, this statement is not met. Lastly, respondents were assumed to be willing to pay more if they felt more responsible for the cause (Bulte et al., 2005). The results in table 6 indicated that the respondents felt the most responsible for biodiversity losses due to human unintentional climate change. However, due to no significant differences between the WTP values, no conclusion about the relationship between the respondents' responsibility and their WTP can be drawn. The same can be said about the seriousness of the cause. Our results show that there is no effect of seriousness on the WTP, as there is no significant difference between the different WTP values.

The last analysis done in this study is about the comparison between the willingness to pay for the prevention or restoration of biodiversity loss. In this paragraph an answer will be formulated to the second hypothesis 'Is there a difference in the willingness to pay of people to restore or to prevent biodiversity losses?'. Table 8 shows the results of the t-tests whereby, for each cause, a comparison was made between the willingness to pay for restoring or preventing the losses. As can be seen, all the differences are not significant. In other words, the null hypothesis that states that differences in WTP are equal, is not rejected for any cause. These results are not in line with previous literature as Bulte et al. (2005) stated that intentional harm is considered more upsetting than unintentional harm. Regarding the results above, it can be stated that

people are not willing to pay more to correct problems caused by humans compared to problems caused by nature itself, as there is no significant difference visible. In this way, the outrage effect is violated. Also the theory from Brown et al. (2005) is violated as they mentioned that respondents consider human-induced losses to be much more serious than these losses resulting from natural events.

We assume that no significant results from the comparison between WTP values in table 8 are present due to the fact that if a respondent is willing to donate for the prevention or restoration of biodiversity loss, it does not matter for the respondents for what cause this donation will be used and what the associated scenario (prevention or restoration) is. However, no literature could be found to confirm this statement.

Table 8: Comparison between WTP of prevention and restoration

Comparison between WTP of prevention and restoration	T-value
Natural	0.81
Natural climate change	1.24
Human unintentional	-0.40
Human unintentional climate change	0.40
Human intentional	0.62

**Significant on 5% significance level*

4.5. Differences between the ESS data, previous research and this paper's results

When comparing the data of the ESS (2016) to the obtained data in this research, similar results can be found. The ESS observed that according to their respondents, humans are the cause of climate change. This is in line with the results observed in this paper. A total of 288 respondents (93.51%) agrees with the fact that humans are the cause of climate change. In comparison, 20 respondents' (6.49%) their opinion is the opposite, namely that nature is causing climate change.

Brown et al. (2005) states that respondents' responsibility is lower when the biodiversity loss is caused by a natural event. Although in the results of the ESS, where the respondents' opinion is that climate change is due to human activity and natural processes and human activity on an

equal level, the responsibility is predominantly high. In our results, similar results as Brown et al. (2005) states, can be found. As can be seen in table 6, the majority of respondents feel more responsibility regarding a human caused fire. 55 respondents feel the most responsibility for natural caused fires, by contrast 213 respondents feel the most responsible considering human caused fires. The remaining 40 respondents do not feel responsible for any type of cause of a fire. More specifically, from the 308 respondents, 149 feel the most responsible for a fire caused by a human unintentional fire due to climate change. This is followed by a human unintentional cause where 47 respondents feel the most responsible for and a natural cause where 46 respondents felt most responsible.

It can be stated that ESS showed that their respondents felt responsible for reducing changes in the environment. From the results from the ESS data, it can be concluded that people's WTP values are not dependent on their feelings of responsibility. This can be confirmed by our regression results, namely that the respondents' feeling of responsibility does not have a significant impact on the WTP value for a specific cause, only for preventing biodiversity loss caused by natural climate change there is a significant impact on a 1% significance level (table 3). As just mentioned, respondents feel most responsible regarding a human unintentional cause due to climate change, a human unintentional cause and a natural cause of a fire, but no significant conclusion can be made about the differences in WTP.

5 Conclusion

Biodiversity loss is an already common occurrence around the world, as much as 31% of the biodiversity on earth has become extinct (Lee, Lee & Lee, 2014). The loss of biodiversity will not cease to occur, but it will continue to decline at unprecedented rates. To find ways of restoring or preventing such losses, the government needs to know what the monetary value of biodiversity is, in other words what people are willing to pay for such biodiversity loss (Galli et al., 2014; Nobel et al., 2020a).

This paper investigates the differences in respondents' willingness to pay for biodiversity loss considering different causes looking at both prevention and restoration. A double-bounded dichotomous regression model was used to obtain the results. As an overall conclusion on our research and underlying research questions, it can be stated that there are no differences in the WTP values between prevention and restoration, and prevention and restoration separately, as

the comparisons are not significant, and the aforementioned hypotheses are not rejected. In other words, the non-use value of biodiversity loss does not depend on its cause. Based on previous research, these results are remarkable. Bulte et al. (2005), Walker et al. (1999) and Brown et al. (2005) states that there clearly was a difference visible in WTP values depending on the cause.

The analysis of results provides valuable insights into the causes that respondents perceived as more important. Respondents consider human-induced losses as more serious in comparison with the same losses resulting from natural causes, this is called the outrage effect. However, due to no significant differences between the WTP values, it cannot be concluded that respondents are willing to pay more in order to reverse the losses caused by humans. Also, for prevention similar results can be found. The weighted average WTP of restoration equals €36.24 compared to an average WTP of €37.65 for prevention. The associated 95% confidence intervals are respectively [€36.20; €26.28] and [€37.49; €37.81]. The Belgian government can use the aforementioned WTP values in order to prevent a fire from happening or the restoration of a site after the occurrence of a fire.

The outrage effect can be explained by a lower sense of responsibility concerning a natural event. On the other hand, the seriousness of a human-caused loss correlates positively with the feeling that someone should pay for the restitution. This correlation is equal to 0.279 and is significant on the 1% significance level. In addition, our research has shown that there are no significant differences between the WTP values, so there is no influence of the seriousness on the WTP. In total 149 respondents (48.38%) feel most responsibility for a human unintentional cause due to climate change and 17 respondents' (5.52%) responsibility is the highest in case of a human intentional cause. However, no conclusion can be drawn as our research obtained no significant results regarding the differences between the WTP values.

All the above-mentioned results are similar to the results examined by ESS. They observed that according to their respondents, humans are the cause of climate change. This is in line with the results observed in this paper. A second similarity is that ESS showed that their respondents felt responsible for reducing changes in the environment.

6 Recommendations for further research

In this research the focus was only on double-bounded dichotomous choice modeling, so for further investigations, it could be interesting to further analyze the maximum people are willing to pay for preventing or restoring biodiversity loss, by taking a look at the open questions. This way it could be more useful for governments to establish regulations based on monetary valuation of non-use values. Another recommendation for researchers is to create only one survey where the respondents are presented with both the questions of what they are willing to pay for restoring and preventing biodiversity loss. In our research we have now two different samples, so there is the possibility that the results are not entirely free of bias. By presenting ten different possibilities to the respondents, there is the possibility that a large part of the respondents will withdraw because of the duration of the survey. Therefore it is advisable, if both prevention and restoration are questioned, to take only two different causes instead of five. A last recommendation is that it would be interesting to also analyze if there is a difference between the WTP values of visitors and non-visitors of the site surveyed.

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9 Appendix

9.1. Appendix A: Survey

Start of Block: Introduction

This questionnaire was developed as part of a master's thesis research project. We, Maité Bouchet and Ine Daniels, are conducting our master thesis under the supervision of Prof. Dr. Sebastien Lizin and Drs. Anne Nobel on biodiversity loss and what economic value people attach to preventing and/or restoring this loss. With this knowledge we hope to get a picture of the economic value of preventing further loss, so that everyone can continue to enjoy the present nature. In order to continue our research, we currently need as many people as possible to fill out the questionnaire below. Therefore we would like to thank you already for your cooperation in helping us.
We would like to emphasize that there are no right or wrong answers and that all information will be processed anonymously and confidentially. The questionnaire takes about 10 minutes. If there are any questions, uncertainties or comments, you may write them down at the end of this questionnaire. You can also always contact us at ine.daniels@student.uhasselt.be.

During this questionnaire, various scenarios will be described regarding the Blue Forest to find out how you value the biodiversity present there. Below you can find some pictures of the Blue Forest to get an impression of the biodiversity present.

End of Block: Introduction

Start of Block: Prevention

In this questionnaire, we are going to ask you a number of questions related to the **prevention** of biodiversity loss. We would like to know how much you are willing to **donate** on a **one-time** basis to a **Belgian nature organisation** to prevent this biodiversity loss to the future. This amount will only be used for prevention measures that keep the loss of biodiversity as minimal as possible, starting in the autumn of 2021 for a **period of 5 years**. If no donation is made, this can lead to a long recovery time for the domain when biodiversity loss actually occurs. The greatest loss can be avoided through these donations.

In order to get a clear picture of the amount you are willing to donate, the causes of this loss will vary on several questions. **It is important that you read the question carefully so that you know what cause it is about.**

End of Block: Prevention

Start of Block: Prevention - Natural cause

Depending on various **natural factors**, such as rainfall, moistness and temperature, different areas can become absolutely dry. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being destroyed by a **spontaneous fire**. Such fires destroy nature and biodiversity at that time, but also cause the region, both visually and touristically, to suffer in the coming years because recovery takes time.

Are you willing to make a one-time donation of € 30 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss...= No

Are you willing to make a one-time donation of € 15 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss....= Yes

Are you willing to make a one-time donation of € 45 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss....= No

And If Are you willing to make a one-time donation of € 15 to help prevent biodiversity loss....= No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

How much are you maximum willing to donate on a one-time basis **to help prevent** biodiversity loss in the Blue Forest with a **natural cause,** in particular a spontaneous fire?

_____

Display This Question:

If How much are you maximum willing to donate on a one-time basis to help prevent biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire?

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Very responsible (1)
- Rather responsible (4)
- Average responsible (5)
- Little responsible (6)
- Not responsible (7)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you about this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **restoring** (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about restoring (rather... !=As much

Are you willing to make a one-time donation of € 30 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

Are you willing to make a one-time donation of € 15 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = Yes

Are you willing to make a one-time donation of € 45 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

And Are you willing to make a one-time donation of € 15 to help RESTORE biodiversity... = No

Why did you answer "No" twice to the previous questions?

- I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- I want to donate, but the amount is lower than € 15. (2)
- I already support a different nature organisation. (3)
- I have ethical or moral objections to putting a monetary value on nature. (4)
- I believe that the government is responsible for nature management. (5)
- I cannot afford it to donate for the recovery or prevention of this loss. (6)
- I do not want to donate extra for nature management. (7)
- Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

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And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis **to help RESTORE** biodiversity loss in the Blue Forest with a **natural cause**, in particular a spontaneous fire?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help RESTORE biodiversity... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Prevention - Natural cause

Start of Block: Prevention - Natural cause (climate change)

Depending on various **natural factors**, such as rainfall, moistness and temperature, different areas can become absolutely dry. These natural factors have been created by **natural climate change**. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being destroyed by a **spontaneous fire caused by natural climate change**. Such fires destroy nature and biodiversity at that time, but also cause the region, both visually and touristically, to suffer in the coming years because recovery takes time.

Are you willing to make a one-time donation of € 30 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent ... = No

Are you willing to make a one-time donation of € 15 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent ... = Yes

Are you willing to make a one-time donation of € 45 **to help prevent** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent ... = No

And Are you willing to make a one-time donation of € 15 to help prevent ... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ I do not want to donate because it is not realistic that climate change is natural from cause. (11)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

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And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

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And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help prevent** biodiversity loss in the Blue Forest with a **natural cause**, in particular a spontaneous fire caused by climate change?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help prevent biodiversity... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain	
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- Very responsible (1)
- Rather responsible (2)
- Average responsible (3)
- Little responsible (4)
- Not responsible (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **restoring** (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire caused by natural climate change ?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss... != As much

Are you willing to make a one-time donation of € 30 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

Are you willing to make a one-time donation of € 15 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = Yes

Are you willing to make a one-time donation of € 45 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

And Are you willing to make a one-time donation of € 15 to help RESTORE biodiversity... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ I do not want to donate because it is not realistic that climate change is natural from cause. (9)
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And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis **to help RESTORE** biodiversity loss in the Blue Forest with a **natural cause**, in particular a spontaneous fire caused by natural climate change?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help RESTORE biodiversity.. Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Prevention - Natural cause (climate change)

Start of Block: Prevention- Human cause (unintentional)

A fire can start from a **human NOT intentional cause**. Imagine the Blue Forest being destroyed by an **accidentally dropped cigarette butt**. Such fires destroy nature and biodiversity at that time, but also bring damage to the region in the years to come, both visually and touristically, as their recovery takes some time.

Are you willing to make a one-time donation of € 30 **to help prevent** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity... = No

Are you willing to make a one-time donation of € 15 **to help prevent** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity... = Yes

Are you willing to make a one-time donation of € 45 **to help prevent** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity... = No

And Are you willing to make a one-time donation of € 15 to help prevent biodiversity... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
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- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

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If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

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And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help prevent** biodiversity loss in the Blue Forest with a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help prevent biodiversity... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Very responsible (1)
- Rather responsible (2)
- Moderately responsible (3)
- Little responsible (4)
- Not responsible (5)

Please indicate 'Moderately liable' as answer to this question.

- Very liable (1)
- Rather liable (2)
- Moderately liable (3)
- Little liable (4)
- Not liable (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **restoring** (rather than preventing) biodiversity loss in the Blue Forest with a human NOT intentional cause, in particular an ignited fire by an accidentally dropped cigarette butt?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about restoring ... != As much

Are you willing to make a one-time donation of € 30 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

Are you willing to make a one-time donation of € 15 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = Yes

Are you willing to make a one-time donation of € 45 **to help RESTORE** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity... = No

And Are you willing to make a one-time donation of € 15 to help RESTORE biodiversity... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ Others, namely: (8) _____

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And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis **to help RESTORE** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help RESTORE biodiversity... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Prevention- Human cause (unintentional)

Start of Block: Prevention - Human cause (unintentional climate change)

A fire can be caused by **climate change that is NOT intentionally caused by humans**. This climate change is caused by for example humans driving too much by car, traveling too much by plane, or creating too much waste. Due to climate change, different areas can become absolutely dry. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being destroyed by a **man-made NOT intentional fire**. Such fires destroy nature and biodiversity at that moment, but also damage the region, both visually and touristically, in the years to come, as their recovery takes some time.

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 30 **to help prevent** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. Are you willing to make a ... = No

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 15 **to help prevent** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. Are you willing to make a ... = Yes

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 45 **to help prevent** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. Are you willing to make a ... = No

And Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. Are you willing to make a ... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ I do not want to donate because it is not realistic that climate change is man-made. (11)
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If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

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And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. What is the maximum amount you would be willing to donate on a one-time basis **to help prevent** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

_____

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. ... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain	
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. To what extent do you feel responsible for this loss of biodiversity in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- Very responsible (1)
- Rather responsible (2)
- Moderately responsible (3)
- Little responsible (4)
- Not responsible (5)

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. To what extent do you feel guilty for this loss of biodiversity in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Very guilty (1)
- ○ Rather guilty (2)
- ○ Guilty on average (3)
- ○ Little guilty (4)
- ○ Not guilty (5)

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. How upset are you by this loss of biodiversity in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **restoring** (rather than preventing) biodiversity loss in the Blue Forest with a human NOT intentional cause, in particular a spontaneous fire caused by human-induced climate change?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss... != As much

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 30 **to help RESTORE** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 15 **to help RESTORE** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = Yes

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 45 **to help RESTORE** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

And If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ I do not want to donate because it is not realistic that climate change is man-made. (10)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. What is the maximum amount you would be willing to donate on a one-time basis **to help RESTORE** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

_____

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. ... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain	
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Prevention - Human cause (unintentional climate change)

Start of Block: Prevention - Human cause (intentional)

Arson is 'the criminal act of **intentionally** setting fire to property'. Unfortunately, even in Belgium, it often happens that fires are intentionally set in nature. Imagine the Blue Forest completely being destroyed by an **ignited fire**. Such fires destroy nature and biodiversity at the time, but also bring damage to the region, both visually and touristically, in the coming years, since their recovery takes some time.

Are you willing to make a one-time donation of € 30 **to help prevent** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest caused… = No

Are you willing to make a one-time donation of € 15 **to help prevent** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest caused… = Yes

Are you willing to make a one-time donation of € 45 **to help prevent** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest caused… = No

And If Are you willing to make a one-time donation of € 15 to help prevent biodiversity loss in the Blue Forest caused… = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help prevent** biodiversity loss in the Blue Forest with a **human intentional cause**, in particular arson?

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help prevent biodiversity… Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very responsible (1)
- Rather responsible (2)
- Moderately responsible (3)
- Little responsible (4)
- Not responsible (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very upset (1)
- Rather upset (2)
- Moderately upset (3)
- Little upset (4)
- Not upset (5)

To what extent do you think the situation described will actually occur?

- Very likely (1)
- Rather likely (2)
- Neither likely, nor unlikely (3)
- Rather unlikely (4)
- Unlikely (5)

Are you willing to pay less, as much, or more if it is about **restoring** (rather than preventing) biodiversity loss in the Blue Forest with a human intentional cause, in particular arson?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss... != As much

Are you willing to make a one-time donation of € 30 **to help RESTORE** biodiversity loss caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity loss… = No

Are you willing to make a one-time donation of € 15 **to help RESTORE** biodiversity loss caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity loss… = Yes

Are you willing to make a one-time donation of € 45 **to help RESTORE** biodiversity loss caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help RESTORE biodiversity loss… = No

And Are you willing to make a one-time donation of € 15 to help RESTORE biodiversity loss… = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis **to help RESTORE** the loss of biodiversity in the Blue Forest with **human intentional cause**, in particular arson?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help RESTORE the loss of biodiversity... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Prevention- Human cause (intentional)

Start of Block: Restoration

In this questionnaire, we are going to ask you some questions related to **restoring** biodiversity loss. For these questions, we would like to know how much you are willing **to donate once** to a **Belgian nature organization** to restore this loss of biodiversity. Hereby, this organization will commit to restoring the Blue Forest to its original state by replanting plants, trees and flowers. This amount will only be used for repairs that eliminate biodiversity loss as much as possible. If no donation is made, this will lead to a very long recovery time for the domain when biodiversity loss actually occurs. Through these donations, the greatest loss can be recovered more quickly by human influences. In order to get a clear picture of the amount you are willing to donate, we will look at the different causes of this loss. **It is important that you read the question carefully so that you know what cause is involved**.

End of Block: Restoration

Start of Block: Restoration - Natural caus

Depending on various **natural factors**, such as rainfall, moistness and temperature, different areas can

become absolutely dry. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being destroyed by a **spontaneous fire**. Such fires destroy nature and biodiversity at that time, but also cause the region, both visually and touristically, to suffer in the coming years because recovery takes time.

Are you willing to make a one-time donation of € 30 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss… = No

Are you willing to make a one-time donation of € 15 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If f Are you willing to make a one-time donation of € 30 to help restore biodiversity loss… = Yes

Are you willing to make a one-time donation of € 45 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss… = No

And f Are you willing to make a one-time donation of € 15 to help restore biodiversity loss… = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help restore** a **natural-origin** biodiversity loss in the Blue Forest, in particular a spontaneous fire?

_____

DisplanQuestion:

If What is the maximum amount you would be willing to donate on a one-time basis to help restore a natural-origin biodiversity loss... Text Response is show

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Very responsible (1)
- Rather responsible (2)
- Average responsible (3)
- Little responsible (4)
- Not responsible (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you about this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **preventing** (rather than restoring) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about preventing (rather than restoring) biodiversity loss in the... != As much

Are you willing to make a one-time donation of € 30 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss = No

Are you willing to make a one-time donation of € 15 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss = Yes

Are you willing to make a one-time donation of € 45 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss = No

And Are you willing to make a one-time donation of € 15 to help PREVENT biodiversity loss = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

How much are you maximum willing to donate on a one-time basis **to help PREVENT** biodiversity loss in the Blue Forest with a **natural cause,** in particular a spontaneous fire?

_____

Display This Question:

If How much are you maximum willing to donate on a one-time basis to help PREVENT biodiversity loss... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Restoration - Natural cause

Start of Block: Restoration - Natural cause (climate change)

Depending on various **natural factors**, such as rainfall, moistness and temperature, different areas can become absolutely dry. These natural factors have been created by **natural climate change**. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being destroyed by a **spontaneous fire, caused by natural climate change**. Such fires destroy nature and biodiversity at that time, but also cause the region, both visually and touristically, to suffer in the coming years because recovery takes time.

Are you willing to make a one-time donation of € 30 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss... = No

Are you willing to make a one-time donation of € 15 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss… = Yes

Q147 Are you willing to make a one-time donation of € 45 **to help restore** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss… = No

And Are you willing to make a one-time donation of € 15 to help restore biodiversity loss… = No

Why did you answer "No" twice to the previous questions?

- I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- I want to donate, but the amount is lower than € 15. (2)
- I already support a different nature organisation. (3)
- I have ethical or moral objections to putting a monetary value on nature. (4)
- I believe that the government is responsible for nature management. (5)
- I cannot afford it to donate for the recovery or prevention of this loss. (6)
- I do not want to donate extra for nature management. (7)
- I do not want to donate because it is not realistic that climate change is natural from cause. (9)
- Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help restore** biodiversity loss in the Blue Forest with a **natural cause**, in particular a spontaneous fire caused by natural climate change?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help restore biodiversity loss... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Very responsible (1)
- ○ Rather responsible (2)
- ○ Average responsible (3)
- ○ Little responsible (4)
- ○ Not responsible (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Very guilty (1)
- ○ Rather guilty (2)
- ○ Guilty on average (3)
- ○ Little guilty (4)
- ○ Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **preventing** (rather than restoring) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire caused by natural climate change?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about preventing (rather than restoring)... != As much

Are you willing to make a one-time donation of € 30 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a natural cause... = No

Are you willing to make a one-time donation of € 15 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a natural cause… = Yes

Are you willing to make a one-time donation of € 45 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **natural cause**, in particular a spontaneous fire triggered by natural climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a natural cause… = No

And Are you willing to make a one-time donation of € 15 to help PREVENT biodiversity loss in the Blue Forest caused by a natural cause… = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ I do not want to donate because it is not realistic that climate change is natural from cause. (11)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

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And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis t**o help PREVENT** biodiversity loss in the Blue Forest with a **natural cause**, in particular a spontaneous fire caused by climate change?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help PREVENT biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire caused by climate change? Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Restoration - Natural cause (climate change)

Start of Block: Restoration - Human cause (unintentional)

A fire can start from a **human NOT intentional cause.** Imagine the Blue Forest being destroyed by an **accidentally dropped cigarette butt**. Such fires destroy nature and biodiversity at that time, but also bring damage to the region in the years to come, both visually and touristically, as their recovery takes some time.

Are you willing to make a one-time donation of € 30 **to help restore** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss in the Blue Forest caused by a human NOT intentional cause… = No

Are you willing to make a one-time donation of € 15 **to help restore** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss in the Blue Forest caused by a human NOT intentional cause… = Yes

Are you willing to make a one-time donation of € 45 **to help restore** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Yes (1)
- No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore biodiversity loss in the Blue Forest caused by a human NOT intentional cause… = No

And Are you willing to make a one-time donation of € 15 to help restore biodiversity loss in the Blue Forest caused by a human NOT intentional cause… = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help restore** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited

fire by an accidentally dropped cigarette butt?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help restore biodiversity loss in the Blue Forest caused by a human NOT intentional caus,... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- Very responsible (1)
- Rather responsible (2)
- Moderately responsible (3)
- Little responsible (4)
- Not responsible (5)

Please indicate 'Moderately liable' as answer to this question.

- Very liable (1)
- Rather liable (2)
- Moderately liable (3)
- Little liable (4)
- Not liable (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- ○ Very guilty (1)
- ○ Rather guilty (2)
- ○ Guilty on average (3)
- ○ Little guilty (4)
- ○ Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire by an accidentally dropped cigarette butt?

- ○ Very upset (1)
- ○ Rather upset (2)
- ○ Moderately upset (3)
- ○ Little upset (4)
- ○ Not upset (5)

To what extent do you think the situation described will actually occur?

- ○ Very likely (1)
- ○ Rather likely (2)
- ○ Neither likely, nor unlikely (3)
- ○ Rather unlikely (4)
- ○ Unlikely (5)

Are you willing to pay less, as much, or more if it is about **preventing** (rather than restoring) biodiversity loss in the Blue Forest with a human NOT intentional cause, in particular an ignited fire by an accidentally dropped cigarette butt?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about preventing (rather than restoring)... != As much

Are you willing to make a one-time donation of € 30 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a human NOT intentional cause... = No

Are you willing to make a one-time donation of € 15 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If BAre you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a human NOT intentional cause... = Yes

Are you willing to make a one-time donation of € 45 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help PREVENT biodiversity loss in the Blue Forest caused by a human NOT intentional cause... = No

And Are you willing to make a one-time donation of € 15 to help PREVENT biodiversity loss in the Blue Forest caused by a human NOT intentional cause... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

What is the maximum amount you would be willing to donate on a one-time basis **to help PREVENT** biodiversity loss in the Blue Forest with a **human NOT intentional cause**, in particular an ignited fire caused by an accidentally dropped cigarette butt?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help PREVENT biodiversity loss in the Blue Forest with a human NOT intentional cause, in particular an ignited fire caused by an accidentally dropped cigarette butt? Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Restoration - Human cause (unintentional)

Start of Block: Restoration - Human cause (unintentional climate change)

A fire can occur because of **climate change that is NOT intentionally caused by humans**. This climate change is caused by humans driving too much by car, traveling too much by plane, or creating too much waste. Due to climate change, different areas can become absolutely dry. In the summer period, for example, this often leads to spontaneous fires in forests, fields, roadsides and so forth. Imagine the Blue Forest completely being **destroyed by a man-made NOT intentional** fire. Such fires destroy nature and biodiversity at that time, but also bring damage to the region in the years to come, both visually and touristically, as their recovery takes some time.

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 30 **to help restore** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional… = No

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 15 **to help restore** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional… = Yes

Climate change is **caused by humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. Are you willing to make a one-time donation of € 45 **to help restore** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

And Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it at the moment to pay for the recovery or prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ I do not want to donate because it is not realistic that climate change is man-made. (10)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. What is the maximum amount you would be willing to donate on a one-time basis **to help**

restore biodiversity loss in the Blue Forest, due to a spontaneous fire caused by NOT intentional climate change?

_____

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. What is the maximum amount you would be willing to donate on a one-time basis to help restore... Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. To what extent do you feel responsible for this loss of biodiversity in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Very responsible (1)
- ○ Rather responsible (2)
- ○ Moderately responsible (3)
- ○ Little responsible (4)
- ○ Not responsible (5)

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. To what extent do you feel guilty for this loss of biodiversity in the Blue Forest due, to a spontaneous fire caused by human-induced climate change?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. How upset are you by this loss of biodiversity in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- Very upset (1)
- Rather upset (2)
- Moderately upset (3)
- Little upset (4)
- Not upset (5)

To what extent do you think the situation described will actually occur?

- Very likely (1)
- Rather likely (2)
- Neither likely, nor unlikely (3)
- Rather unlikely (4)
- Unlikely (5)

Are you willing to pay less, as much, or more if it is about **preventing** (rather than restoring) biodiversity loss in the Blue Forest with a human NOT intentional cause, in particular a spontaneous fire caused by human-induced climate change?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about preventing (rather than restoring)... != As much

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 30 **to help PREVENT** biodiversity loss in the Blue Forest due, to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 15 **to help PREVENT** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = Yes

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional.** Are you willing to make a one-time donation of € 45 **to help PREVENT** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

And Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ I do not want to donate because it is not realistic that climate change is man-made. (11)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

Climate change is caused by **humans** (e.g. because humans travel too much by plane), but this is **NOT intentional**. What is the maximum amount you would be willing to donate on a one-time basis **to help PREVENT** biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change?

_____

Display This Question:

If Climate change is caused by humans (e.g. because humans travel too much by plane), but this is NOT intentional. What is the maximum amount you would be willing to donate on a one-time basis to help PREVENT biodiversity loss in the Blue Forest, due to a spontaneous fire caused by human-induced climate change? Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Restoration - Human cause (unintentional climate change)

Start of Block: Restoration - Human cause (intentional)

Arson is 'the criminal act of **intentionally** setting fire to property'. Unfortunately, even in Belgium, it often happens that fires are intentionally set in nature. Imagine the Blue Forest completely destroyed by an **ignited fire**. Such fires destroy nature and biodiversity at the time, but also bring damage to the region, both visually and touristically, in the coming years, since their recovery takes some time.

Are you willing to make a one-time donation of € 30 **to help restore** the biodiversity caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore the biodiversity caused in the Blue Forest by a human intentional cause, in particular arson? = No

Are you willing to make a one-time donation of € 15 **to help restore** the biodiversity caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore the biodiversity caused in the Blue Forest by a human intentional cause, in particular arson? = Yes

Are you willing to make a one-time donation of € 45 **to help restore** the biodiversity caused in the Blue Forest by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help restore the biodiversity caused in the Blue Forest by a human intentional cause, in particular arson? = No

And Are you willing to make a one-time donation of € 15 to help restore the biodiversity caused in the Blue Forest by a human intentional cause, in particular arson?... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (2)
- ○ I already support a different nature organisation. (3)
- ○ I have ethical or moral objections to putting a monetary value on nature. (4)
- ○ I believe that the government is responsible for nature management. (5)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (6)
- ○ I do not want to donate extra for nature management. (7)
- ○ Others, namely: (8) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

And Why did you answer "No" twice to the previous questions? != I already support a different nature organisation.

And Why did you answer "No" twice to the previous questions? != I have ethical or moral objections to putting a monetary value on nature.

And Why did you answer "No" twice to the previous questions? != I believe that the government is responsible for nature management.

And Why did you answer "No" twice to the previous questions? != I cannot afford it to donate for the recovery or the prevention of this loss.

And Why did you answer "No" twice to the previous questions? != I do not want to donate extra for nature management.

And Why did you answer "No" twice to the previous questions? != Others, namely:

And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

What is the maximum amount you would be willing to donate on a one-time basis **to help restore** the loss of biodiversity in the Blue Forest with **human intentional cause**, in particular arson?

_____

Display This Question:

If What is the maximum amount you would be willing to donate on a one-time basis to help restore the loss of biodiversity in the Blue Forest with human intentional cause, in particular arson? Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

To what extent do you feel responsible for this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very responsible (1)
- Rather responsible (2)
- Moderately responsible (3)
- Little responsible (4)
- Not responsible (5)

To what extent do you feel guilty for this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very guilty (1)
- Rather guilty (2)
- Guilty on average (3)
- Little guilty (4)
- Not guilty (5)

How upset are you by this destruction in the Blue Forest caused by a **human intentional cause**, in particular arson?

- Very upset (1)
- Rather upset (2)
- Moderately upset (3)
- Little upset (4)
- Not upset (5)

To what extent do you think the situation described will actually occur?

- Very likely (1)
- Rather likely (2)
- Neither likely, nor unlikely (3)
- Rather unlikely (4)
- Unlikely (5)

Are you willing to pay less, as much, or more if it is about **preventing** (rather than restoring) biodiversity loss in the Blue Forest with a human intentional cause, in particular arson?

- ○ Less (1)
- ○ As much (2)
- ○ More (3)

Display This Question:

If Are you willing to pay less, as much, or more if it is about preventing (rather than restoring) biodiversity loss in the Blue Forest with a human intentional cause, in particular arson? != As much

Are you willing to make a one-time donation of € 30 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest... = Yes

Are you willing to make a one-time donation of € 15 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest... = Yes

Are you willing to make a one-time donation of € 45 **to help PREVENT** biodiversity loss in the Blue Forest caused by a **human intentional cause**, in particular arson?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you willing to make a one-time donation of € 30 to help prevent biodiversity loss in the Blue Forest... = No

And Are you willing to make a one-time donation of € 15 to help prevent biodiversity loss in the Blue Forest... = No

Why did you answer "No" twice to the previous questions?

- ○ I do not wish to donate for this, but want to contribute to nature management in a different way. (1)
- ○ I want to donate, but the amount is lower than € 15. (4)
- ○ I already support a different nature organisation. (5)
- ○ I have ethical or moral objections to putting a monetary value on nature. (6)
- ○ I believe that the government is responsible for nature management. (7)
- ○ I cannot afford it to donate for the recovery or the prevention of this loss. (8)
- ○ I do not want to donate extra for nature management. (9)
- ○ Others, namely: (10) _____

Display This Question:

If Why did you answer "No" twice to the previous questions? != I do not wish to donate for this, but want to contribute to nature management in a different way.

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And Why did you answer "No" twice to the previous questions? Others, namely: Is empty

And Are you willing to pay less, as much, or more if it is about restoring (rather than preventing) biodiversity loss in the Blue Forest with a natural cause, in particular a spontaneous fire? != As much

How much are you maximum willing to donate on a one-time basis **to help PREVENT** biodiversity loss in the Blue Forest with a **human intentional cause**, in particular arson?

_____

Display This Question:

If How much are you maximum willing to donate on a one-time basis to help PREVENT biodiversity loss in the Blue Forest with a human intentional cause, in particular arson? Text Response is displayed

How confident are you about the answer you gave to the previous question? Please indicate on the scale below from 0 to 10, with 0 uncertain and 10 completely certain.

	Uncertain									Certain
	0	1	2	3	4	5	6	7	8	9	10
Certainty ()											

End of Block: Restoration - Human cause (intentional)

Start of Block: General scenario questions

Which scenario do you think is the worst?

- ○ Human intentional cause (e.g. arson) (1)
- ○ Natural cause (e.g. spontaneous fire) (2)
- ○ Natural cause (e.g. spontaneous fire due to natural climate change) (6)
- ○ Human NOT intentional cause (e.g. spontaneous fire caused by climate change) (3)
- ○ Human NOT intentional cause (e.g. ignited fire caused by an accidentally dropped cigarette butt) (5)
- ○ None (4)

Which scenario upsets you the most?

- ○ Human intentional cause (e.g. arson) (1)
- ○ Natural cause (e.g. spontaneous fire) (2)
- ○ Natural cause (e.g. spontaneous fire due to natural climate change) (5)
- ○ Human NOT intentional cause (e.g. spontaneous fire caused by climate change) (3)
- ○ Human NOT intentional cause (e.g. ignited fire caused by an accidentally dropped cigarette butt) (6)
- ○ None (4)

Which scenario gives you the greatest sense of responsibility?

- ○ Human intentional cause (e.g. arson) (1)
- ○ Natural cause (e.g. spontaneous fire) (2)
- ○ Natural cause (e.g. spontaneous fire due to natural climate change) (5)
- ○ Human NOT intentional cause (e.g. spontaneous fire caused by climate change) (3)
- ○ Human NOT intentional cause (e.g. ignited fire caused by an accidentally dropped cigarette butt) (6)
- ○ None (4)

Which scenario gives you the greatest sense of guilt?

- ○ Human intentional cause (e.g. arson) (1)
- ○ Natural cause (e.g. spontaneous fire) (2)
- ○ Natural cause (e.g. spontaneous fire due to natural climate change) (5)
- ○ Human NOT intentional cause (e.g. spontaneous fire caused by climate change) (3)
- ○ Human NOT intentional cause (e.g. ignited fire caused by an accidentally dropped cigarette butt) (6)
- ○ None (4)

Do you think climate change is recently being caused by humans or nature?

- ○ Man-made (1)
- ○ By nature (2)

End of Block: General scenario questions

Start of Block: General questions

Did you know the Blue Forest before this questionnaire?

- ○ Yes (1)
- ○ No (2)

Display This Question:
If Did you know the Blue Forest before this questionnaire? = Yes

Have you already visited the Blue Forest?

- ○ Yes (1)
- ○ No (2)

Display This Question:
If Have you already visited the Blue Forest? = Yes

How many times have you visited the Blue Forest in the past year (2020-2021)? (Please express in numbers)

_____

Where do you live (zip code)?

_____

Do you work?

- ○ Yes (21)
- ○ No (22)

Display This Question:

If Do you work? = Yes

Where do you work (zip code)?

_____

Are you, or someone in your household, a member of a nature organization?

- ○ Yes, namely: (1) _____
- ○ No (2)

What is your age?

- ○ < 18 (7)
- ○ 18 - 25 (1)
- ○ 26 - 35 (2)
- ○ 36 - 45 (3)
- ○ 46 - 55 (4)
- ○ 56 - 65 (5)
- ○ > 65 (6)

Q38 What is your gender?

- Male (1)
- Female (2)
- X (3)
- I would rather not say (4)

What is your highest diploma?

- Primary school (1)
- Secondary school, high school (2)
- Higher education (3)
- University (4)
- Postgraduate program (ManaMa, PhD) (5)
- Other, namely: (6) _____

What is your current (main)professional status?

- Employee (1)
- Self-employed/Company leader/Liberal profession (2)
- Civil servant/Teacher (3)
- Job seeker (4)
- Houseman/Housewife (5)
- Retired (6)
- Student (7)
- Other, namely: (8) _____

What is your monthly net (household) income? (Think about wages, pension, social security payments...)

- ○ € 0 - 1000 (1)
- ○ € 1001-2000 (2)
- ○ € 2001 - 3000 (3)
- ○ € 3001 - 4000 (4)
- ○ € 4001 - 5000 (5)
- ○ € 5001 - 6000 (6)
- ○ > € 6000 (7)
- ○ I would rather not say (8)

Do you believe your life is financially comfortable at the moment?

- ○ Yes (1)
- ○ No (2)

Do you think your life has enough job security right now?

- ○ Yes (1)
- ○ No (2)

Thank you very much for your cooperation in our research. If you have any comments, please leave them in the text box below.

_____

If you would like to be informed of the final result of this survey, you may always send an e-mail to **ine.daniels@student.uhasselt.be**.

End of Block: General questions