Nature and wildlife based leisure in Singapore: Exploring the relations between wildlife value orientations, nature related interests and wildlife conservation support

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Abstract

This research investigates the reliability and predictive validity of people their wildlife value orientations, wildlife conservation support and future nature interests. It does so by studying the visitors of Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve in Singapore collecting data based on structured questionnaire and analysing this data with the computer program Statistical Package for the Social Sciences (SPSS). The wildlife value orientation scales and wildlife conservation support scales were reliable, but the future nature interests scales proved to be less reliable. The wildlife value orientation scales had predictive validity towards visitors' conservation support and their future nature interests, but the predicative validity of the wildlife conservation support scales towards visitors' future nature interests was low. Notably the future nature interests scale and the hunting belief sub-scale appeared not to reflect basic thinking about nature and wildlife in this Singaporean case. The data suggests two different future nature interests scales, future nature affiliation versus future nature use, and two different hunting dimensions, human hunting opportunities versus wildlife hunting consequences. For future research to be able to make cross-national comparisons, modifications of these scales are recommended to better reflect people their wildlife value orientations and future nature interests.

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1. Introduction

1.1. Human-wildlife relations in nature based recreation

Recreation and tourism based on nature and wildlife viewing is increasing in popularity across the world. As a result, values of conservation, animal welfare, visitor satisfaction and profitability are often in conflict with each other in wildlife-based recreation and trade-offs between them are sought after. While many different contrasting factors are involved in wildlife-based recreation and tourism, of which the most obvious one is environmental impacts versus quality of the experience, this form of recreation/tourism has the potential to positively impact the actions, appreciation and awareness of nature area visitors regarding wildlife and nature (Ballantyne, Packer and Falk, 2011; Falk et al, 2012). Visitors in nature-based recreation approach wildlife interactions from a diverse variety of life backgrounds and motivations, and any examination of the components of nature and wildlife-based leisure must take these visitor motivations and attitudes into account (Reynolds and Braithwaite, 2001). A typology which reflects these fundamental differences in values while taking into account that it is possible that an individual can encompass more than one value is therefore very useful, because the same person can express the characteristics of different beliefs at different times and under different circumstances (Reynolds and Braithwaite, 2001). For instance, it is suggested that members of the general public tend to be interested in individual animals like pets and are concerned for the right and wrong treatment of animals, especially cruelty. Whereas wildlife managers and experts tend to be more concerned for the environment as a wildlife-habitat system, interested in the physical attributes and biological functioning of animals and are concerned for the practical and material value of animals and their habitats. Resulting in differences which are likely to be the basis of tensions between managers of wildlife based recreation and the users of these activities (Reynolds and Braithwaite, 2001).

However, still a common justification for developing wildlife-based recreation attractions is that they help to secure long-term conservation of wildlife and wildlife habitats. And although managers and guides often highlight their role in protecting wildlife and its habitat, yet little is known about the interests, needs and preferences of the visitors who participate in such wildlife-based recreation activities (Ballantyne, Packer and Falk, 2011; Falk et al, 2012). Findings suggest that wildlife-based recreation practices which present a consistent message regarding interactions with wildlife, communicate the reasons behind any constraints imposed and enlist visitors as conservation partners, are likely to be successful in meeting the needs of both visitors and wildlife (Ballantyne, Packer and Falk, 2011; Falk et al, 2012). There is evidence that aspects of the experience itself are also important and that attributes such as motivation to learn and visit commitment are being labeled as good predictors of the impact of wildlife-based recreation. In particular reflective engagement, which involves cognitive and affective processing of the experience, is found to be associated with environmental learning and visit commitment in wildlife-based recreation and tourism (Ballantyne, Packer and Falk, 2011; Falk et al, 2012).

Furthermore, research has demonstrated these positive impacts of wildlife recreation on visitors' environmental attitudes and knowledge, the development of people their appreciation and respect for nature and wildlife, and raising visitors' awareness of environmental issues. However, only a few studies have attempted to deeply investigate these broad patterns across multiple experiences and sites or to truly understand the causative factors that affect these impacts (Ballantyne, Packer and Falk, 2011; Falk et al, 2012). These studies came with conclusions that so called wildlife value orientations of people can predict their wildlife-related attitudes and behaviors (Manfredo et al., 2009), conservation support (Hermann et al., 2013), and acceptability of wildlife management interventions (Jacobs, Vaske & Sijtsma, 2014; Sijtsma, Vaske, & Jacobs, 2012). The term wildlife value orientations refers to fundamental wildlife cognitions which serve as a

foundation for wildlife beliefs and attitudes (Fulton, Manfredo & Lipscomb 1996). Understanding these wildlife value orientations is important as they are essential parts that direct much of our wildlife-based behavior (Fulton, Manfredo & Lipscomb 1996). It is thought that the same wildlife value orientations are shared by many people within a culture and the term wildlife value orientations would therefore as a bare concept on its own not be able to explain much of the variability between people's behaviors and attitudes towards wildlife. However, it is theorized that these wildlife value orientations have an indirect influence on higher order cognitions such as beliefs (in this case towards wildlife). For example, two people might emphasize the importance of the same wildlife value orientation, but they might still differ in their beliefs towards wildlife concerning their individual lives. This makes it important to be aware, while doing research on human-wildlife relations and interactions, of the fact that wildlife value orientations can be interpreted differently by different people and do therefore not always result in the same beliefs and behavior towards wildlife (Fulton, Manfredo & Lipscomb 1996).

The theoretical model of this study will also be based on the identification of people their wildlife value orientations in order to predict their long-term wildlife related attitudes and behaviours as well as their conservation support and knowledge. Or, in other words, this study will continue and elaborate on previous work in this relatively little explored research area by investigating how nature area visitors their wildlife value orientations produce predictive future wildlife related attitudes and behaviours and current wildlife conservation support and knowledge. Based on non-experimental data these predictive relationships are tested with a statistical technique done with the computer program Statistical Package for the Social Sciences (SPSS). Its application in the context of wildlife value orientations enables the identification of basic beliefs that are most influential in predicting people their future wildlife based behaviours and attitudes as well as in predicting their current wildlife conservation knowledge and engagement. It is hypothesised that nature area visitors' wildlife value orientations and basic beliefs will to some extent predict their future wildlife related behaviours and attitudes as well as their current wildlife conservation engagement and knowledge (Zainal and Jacobs, 2016). Maybe there might also be a link between the wildlife conservation knowledge and support of people and their future wildlife related attitudes and behaviours, without the need of studying their wildlife value orientations beforehand. Or there could be a link between the cultural or demographic background of people and their wildlife value orientations. These are things this research will elaborate upon as well.

1.2. Case study and accompanying research objectives

Elaborating on these hypotheses, this study will focus on visitors' wildlife value orientations and basic beliefs in a completely urbanized country and will specify on nature and wildlife-based recreation in Singapore. This country, consisting almost entirely of one big city has one of the highest population densities in the world (Singapore in figures 2018, www.singstat.gov.sg). In such an environment it is hard to incorporate space for nature. But Singapore still managed to include within its territories more than seventy parks and four nature reserves (www.nparks.gov.sg). But questions will raise such as: how do residents of Singapore and tourists visiting this country value these nature areas, or what is their attitude towards wildlife and nature in general, or what role do nature and wildlife play for citizens and tourists in a country like Singapore which is well known for its urban environment instead of its nature areas? Especially in these very urbanized environments and countries it could very well be that nature based recreation plays a big role in the leisure activities of its citizens and tourists. On top of that, it is said that wildlife conservation is only as strong as its community support (Reynolds and Braithwaite, 2001). The increase in the proportion of the population that is urban and remote from the natural world is driving the increasing demand for wildlife recreation and it has therefore great

potential as a tool for wildlife conservation surrounding urbanized environments (Reynolds and Braithwaite, 2001).

This research will study the visitors of two nature reserves in Singapore. The first nature reserve of which the visitors are being studied is Bukit Timah Nature Reserve. This 163 hectares nature reserve, situated in the middle of the island, includes Singapore's highest hill named Bukit Timah Hill and retains one of the few areas of primary rainforest in the country. Established in 1883, Bukit Timah Forest Reserve was one of the first forest reserves to be created in Singapore. The Bukit Timah area was in 1990 declared as Nature Reserve and was officially declared an ASEAN Heritage Park in 2011. It is now part of a prestigious regional network of 35 protected areas, forming the complete spectrum of representative ecosystems in ASEAN Member States (www.nparks.gov.sg). Sungei Buloh is the second nature reserve of which the visitors are being studied. Sungei Buloh is a nature reserve at the northern coastline of Singapore and was first opened as a nature park in 1993. In 2002 this park of then 130 hectares was officially turned into a nature reserve and renamed Sungei Buloh Wetland Reserve to better reflect its status. In 2003, Sungei Buloh Wetland Reserve became Singapore's first ASEAN Heritage Park. Since then Sungei Buloh has expanded to include 202 hectares of mangroves, mudflats, ponds and forests, which together provide a sanctuary for many species of flora and fauna in the park (www.nparks.gov.sg).

Subsequently, this study will research these visitors' attitudes towards wildlife and nature by using structured questionnaires. The structured questionnaires contain questions and statements based on three main concepts: wildlife value orientations, anticipated future attitudes and behavior regarding wildlife and wildlife conservation support and knowledge. The focus of this research will be on the relations that exist between people their wildlife value orientations, their future wildlife based attitudes and behavior and their conservation knowledge and support. As mentioned before, the research takes place in two nature areas, representing wildlife based recreation in a metropolitan area. As an additional advantage, the outcomes of this study can help to inform organizational bodies in Singapore concerned with wildlife and nature protection and management in what strategies they can adopt in order to help nature and wildlife without disturbing the experience of the people visiting nature reserves and parks. Formulating a concrete research objective out of all the before mentioned results in the following concise statement:

To better understand nature and wildlife based leisure and recreation in a metropolitan area like Singapore, this study researches people visiting the Sungei Buloh Wetland Reserve and the Bukit Timah Nature Reserve in Singapore by exploring the relations between visitors' wildlife value orientations, their anticipated future wildlife based intentions and their wildlife conservation support attitudes and knowledge.

This research objective is accompanied by three main research questions:

1. What is the relation between the wildlife value orientations of people visiting the Sungei Buloh Wetland Reserve and the Bukit Timah Nature Reserve and their anticipated future behavioral intentions regarding wildlife and nature?
2. What is the relation between the wildlife value orientations of people visiting the Sungei Buloh Wetland Reserve and the Bukit Timah Nature Reserve and their wildlife conservation support attitudes and knowledge?
3. What is the relation between the wildlife conservation support attitudes and knowledge of people visiting the Sungei Buloh Wetland Reserve and the Bukit Timah Nature Reserve and their anticipated future behavioral intentions regarding wildlife and nature?

The hypothesis of this research is that peoples' wildlife value orientations to some extent influence their anticipated future wildlife based intentions and their wildlife conservation support attitudes and knowledge. But also that the wildlife conservation support attitudes and knowledge of people will influence their anticipated future wildlife based intentions as well. The hypothesis suggests that these three concepts are connected to each other in a positive manner, meaning that when somebody has a positive wildlife value orientation it is likely that this person also will have positive future wildlife based intentions and is positive towards wildlife conservation. The same positive relation is hypothesized to be applicable between wildlife conservation support attitudes and future wildlife based intentions. To further explain the hypothesis, this research will elaborate on the three concepts in the next chapter.

2. Theoretical Framework

Empirically researching the complex relations that exist between human well-being and behaviour, and nature and wildlife conservation goals can be done in a variety of ways. Investigating these relations is difficult because social problems can be understood and perceived in different ways influenced by how people are educated and raised (culture), but also by their life experiences and the options they have faced in life (McShane et al, 2011; Minteer & Miller, 2011). Pre-existing assumptions about the right approach to study these relations often fail to adequately address differences in understanding and power aspects between people, and can therefore limit the success of policy interventions based on nature and wildlife conservation. As new approaches and methods continue to emerge to study the field between human well-being and behaviour on the one hand and nature and wildlife conservation on the other hand, theories that are used often in this field of research are based on ecosystem service approaches, such as the win-win theory and the trade-offs theory (McShane et al, 2011; Minteer & Miller, 2011). These theories offer a framework for better understanding and negotiating the benefits and costs of nature and wildlife conservation. Managing ecosystem services and creating payment systems for the maintenance of them are approaches part of this framework and have received substantial interest as a way of addressing the relations between human well-being and conserving nature (McShane et al, 2011; Minteer & Miller, 2011). But creating incentive or management systems based on such a framework seems unlikely to result in clear win-win or fair trade-off outcomes, at least not more than for instance other comparable frameworks like the Integrated Conservation and Development Projects (ICDPs) framework. This does not necessarily have to mean that all these frameworks are not worth pursuing, but just that the win-wins and trade-offs involved should be debated, assessed and discussed further in a proper and truthful way in order to make these frameworks more reliable (McShane et al, 2011; Minteer & Miller, 2011).

2.1. Attitude-theories

Instead of looking at the relation between human well-being and behaviour on the one hand, and nature and wildlife conservation on the other hand from an ecosystem service framework point of view, there are also approaches that look at it from a social-psychological perspective, for instance in the form of attitude theories. Attitudes of people are studied extensively for many years and researchers have created lots of well-founded conceptualisations of attitudes across many different contexts (Manfredo, 2008). The development of these attitude theories all have in common that they focus on 1) the consistency among attitudes, 2) the effect of past behaviour on attitudes, 3) the attitude-behaviour relationship and 4) the recognition that people can hold two contradictory attitudes (Manfredo, 2008). These theoretical approaches to peoples' attitudes have been applied to human dimensions of natural resources and wildlife, of which the descriptive non-theoretical approaches to attitudes are the most popular ones (Manfredo, 2008). Especially the attitude theory of Fishbein and Ajzen "Theory of Reasoned Action" and Ajzen's "Theory of Planned Behaviour" are most frequently used, as these two theories yield readily useable results for policy and management decisions and have strong predictive validity. For instance the Theory of Planned Behaviour is used a lot to model the determinants of human social behaviour in outdoor recreational activities such as hunting, biking, boating and so on (Hrubes, Ajzen and Daigle, 2001). Both these attitude studies have been the most frequently used investigations in human dimensions of natural resources and wildlife, because 1) they are relatively easy to conduct and interpret, 2) they are easy for participants to engage in, 3) they offer the promise of behavioural prediction and behaviour change and 4) they are a critical component of many more complex concepts (Manfredo, 2008).

However, this demands a clear description and conceptualization of an attitude-concept of people. An attitude basically is an evaluation of an object built on three components: 1) behaviour, 2) feelings or affect, and 3) beliefs about the object (Manfredo, 2008). There are two types of attitudes: implicit attitudes and explicit attitudes. The implicit attitudes built on repeated associations and become quickly and automatically retrieved, but are difficult to measure because they do not involve cognitive processing, whereas the explicit attitudes are built on active cognitive processing and can be easily measured with the use of interviews or survey responses to fixed-format questions (Manfredo, 2008). The concepts of attitude based theories are relevant for a big variety of research objectives from studying illiterate rural residents in developing countries to highly educated residents of developed countries (Manfredo, 2008). However, attitude based studies sometimes try to get people to respond on topics they poorly understand as they could have no experience with it or knowledge about it. These studies result in poor predictive validity and considerations of salience, specificity and attitude strength need to be taken into account to improve the results when using attitude based studies (Manfredo, 2008).

2.2. Value-theories

While peoples' attitudes can vary from situation to situation, peoples' values are unchanging. Consistency in the direction and pattern of peoples' attitudes and norms arise from the basis of their values (Manfredo, 2008). Going further than just a description of attitudes, researchers have tried to identify values related to wildlife-based activities. A number of these studies demonstrated that values can influence behaviour by impacting lower-order beliefs and attitudes (Hrubes, Ajzen and Daigle, 2001). Characteristics of values suggest they direct behaviour by influencing attitudes as they belong to a hierarchy of cognitions. As values are culturally directed ways of meeting basic human needs they are transmitted as part of cultural learning and are formed slowly (Manfredo, 2008). A value-attitude-behaviour model was suggested by researchers to investigate the relations and effects of values on attitudes and behavioural intentions (Hrubes, Ajzen and Daigle, 2001). Research on values toward wildlife was one of the earliest studies conducted by researchers specialised in the human dimensions of wildlife. The concept of values has been used often in studies of human-wildlife relationships and also will be likely to be used more frequently in the future (Manfredo, 2008). Cognitive hierarchy studies related to nature recreation and environmental behaviours often focused on relatively specific value orientations instead of the more fundamental values to life such as power, universalism and achievement (Hrubes, Ajzen and Daigle, 2001). Studies in the past have tried to develop a basic classification of types of values, categorizing the different ways people think about wildlife and how their basic thoughts affect their behaviour. Given the broad nature of these value orientation concepts, they can offer an approach for building a broadly generalizable, cross-cultural explanation of human-wildlife relationships (Manfredo, 2008). Among these early efforts, the approach that stuck around and was used most often was Kellert's values typology (see figure 1) as it helped nature-managers in considering the social dimensions of wildlife management and as a result instigated additional research (Manfredo, 2008). In Kellert's work a typology of categorizations is suggested which reflects fundamental differences in values. Individuals can be allocable to more than one category as the same person can show the characteristics of different categories under different circumstances and times. Kellert suggests that members of the general public tend to be moralistic and humanistic in most instances (Reynolds and Braithwait, 2001).

Value	Definition
Utilitarian	Practical and material exploitation of nature
Naturalistic	Direct experience and exploration of nature
Ecologistic-scientific	Systematic study of the structure, function, and relationship in nature
Aesthetic	Physical appeal and beauty of nature
Symbolic	Use of nature for language and thought
Humanistic	Strong emotional attachment and "love" for aspects of nature
Moralistic	Spiritual reverence and ethical concern for nature
Dominionistic	Mastery, physical control, and dominance of nature
Negativistic	Fear, aversion, and alienation from nature

Figure 1: Kellert's typology of basic values (Kellert 1996)

However, studies using Kellert's values typology must be aware of the methodological (how to measure someone's basic values) and conceptual (many different conceptual basic values) weaknesses of this theory (Manfredo, 2008). Therefore two other value orientation based theories by Rokeach and Schwartz, two social psychologists offering predominant theories about values, are introduced. Rokeach's theory presents a typology of values where they function as desired end states and modes of conduct (Manfredo, 2008). Schwartz's theory goes a step further in which a typology of opposing value types were developed to explain differences among people, called fundamental life values (see figure 2). In the wildlife and environmental fields, Schwartz's theory is used often (Manfredo, 2008). Although this value theory of Schwartz encompasses many ideas about human nature, it might lack to reveal the influence of certain ideologies and orientations on a group of people or the cultural personality of a group of people. This theory is about the generally stable structures of broad fundamental values to life (Hrubes, Ajzen and Daigle, 2001). Value orientations, in contrast to these fundamental values of Schwartz, are built on patterns of beliefs relative to a specific topic (e.g. in this case wildlife).

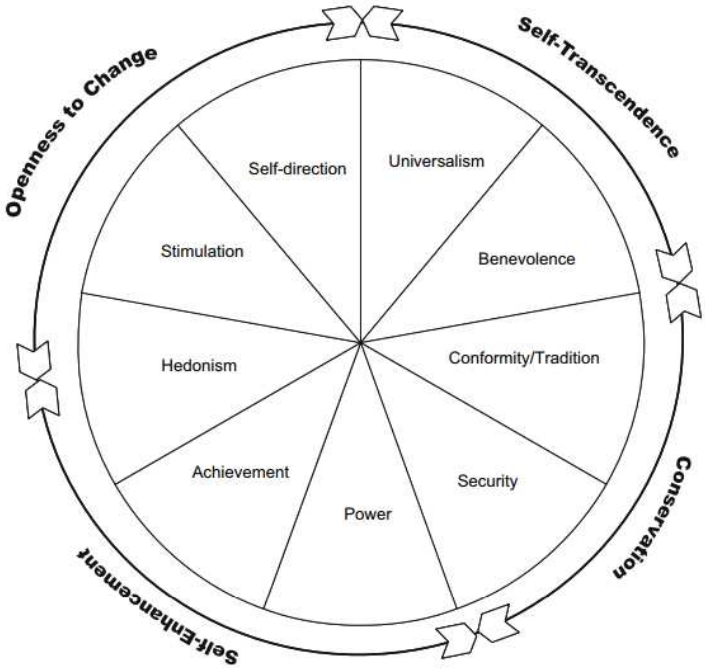

Figure 2: Universals in the content and structure of values (Schwartz, 1992)

2.3. Basic belief-theories

In research of Fulton and Manfredo four basic wildlife beliefs have been identified called the appropriate use belief, the hunting belief, the social affiliation belief and the caring belief. Those four basic wildlife beliefs comprise two distinct wildlife value orientations, one consumptive value (the domination orientation) and one appreciative value (the mutualism orientation). These four basic wildlife beliefs and two wildlife value orientations can explain a considerable proportion of the variability of respondents' attitudes towards wildlife-based recreation (Hrubes, Ajzen and Daigle, 2001). Therefore most researchers in the field of human-wildlife relations like to work with these basic beliefs and wildlife value orientations models. It gets used often as an approach in international research in human-wildlife relations (Manfredo, 2008).

As such a basic belief-theory is 1) based on values, 2) tends from the general to the specific and 3) predicts future behaviours and intentions, it is often based on a hierarchical framework in which values provide the basis for forming general and specific attitudes. These general attitudes are considered valid predictors of general behaviours, whereas the specific attitudes are considered valid predictors of specific actions (Tarrant, Bright and Cordell, 1997). However, external non-attitudinal factors can affect the linkages between these beliefs, values, attitudes and behaviours. For instance, in the case of human-wildlife issues an important external variable is the objective and factual knowledge of people regarding wildlife and nature (Tarrant, Bright and Cordell, 1997). From a theoretical perspective, knowledge links public beliefs and values with preferences and attitudes. Still it is hard to say if knowledge plays a moderating role in the formation of attitudes towards wildlife issues based on the beliefs and values that individuals have (Tarrant, Bright and Cordell, 1997). Regarding wildlife beliefs (or wildlife value orientations) this research will continue with the incorporation of two concepts in its theoretical framework, as mentioned by Tarrant, Bright and Cordell (1997): 1) predictability in future attitudes and beliefs and 2) wildlife conservation knowledge and support. This theoretical framework to study human-wildlife relations from a social-psychological perspective is then used to look at the relations between wildlife value orientations (basic beliefs), future wildlife-based attitudes and beliefs, and wildlife conservation knowledge and support (see figure 3).

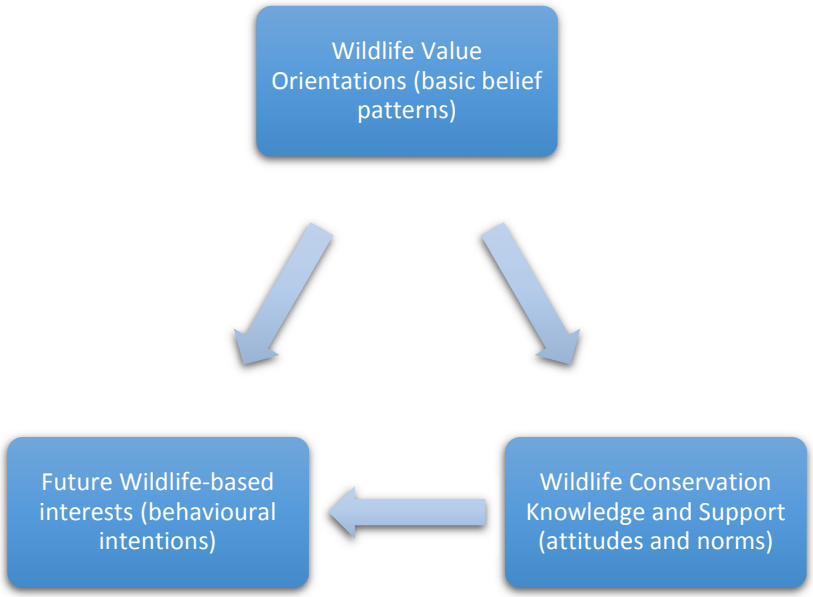

Figure 3: conceptual framework of the relations between wildlife value orientations, future wildlife-based interests, and wildlife conservation knowledge and support

2.4. Framework based on cognitive wildlife research

A cognitive hierarchy theory has been developed by researchers Manfredo, Fulton, Teel, Whittaker, Vaske, Jacobs and their colleagues for studying human behaviour and thought towards wildlife (Jacobs et al, 2012; Fulton, Manfredo, & Lipscomb, 1996; Manfredo, 2008; Teel & Manfredo, 2009; Whittaker, Vaske, & Manfredo, 2006). This theory includes a framework that emphasizes that values belong to a hierarchy of cognitions, including behavioural intentions, attitudes/norms, value orientations (basic belief patterns) and values, together forming the basis for human behaviour from a social psychology point of view (Jacobs et al, 2012). In this hierarchy behavioural intentions are the most specific cognitions and the immediate predecessors of people their actual behaviour, whereas values are the most abstract cognitions (Jacobs et al, 2012). These values are not likely to explain a whole lot of the variability in specific behaviours within cultures and are few in number and resistant to change, because they are tied to a person's identity (central to beliefs), transcend situations, are culturally constructed and often formed early in life (Jacobs et al, 2012). Rather, it is stated that ideologies give meaning and direction to these values in a given context (Manfredo et al., 2009; Teel & Manfredo, 2009). The value orientations that result from these fundamental values are reflected in a schematic network of basic beliefs and provide contextual meaning in a given domain such as wildlife, see figure 4 (Jacobs et al, 2012). This means that wildlife value orientations relate more directly to wildlife than fundamental values do and therefore these value orientations are more useful in explaining individual variation in wildlife-related behaviours and attitudes, which are characterized to be specific to situations, peripheral, quick to change and numerous (Jacobs et al, 2012). In other words, wildlife value orientations mediate the relationship between general values and attitudes in specific situations regarding wildlife (Manfredo et al., 2009) and they can be defined as sets of basic beliefs towards wildlife. These wildlife value orientations provide organization and consistency among the broad spectrum of the higher order cognitions such as attitudes, norms, behavioral intentions and behaviors regarding wildlife (Fulton, Manfredo & Lipscomb, 1996).

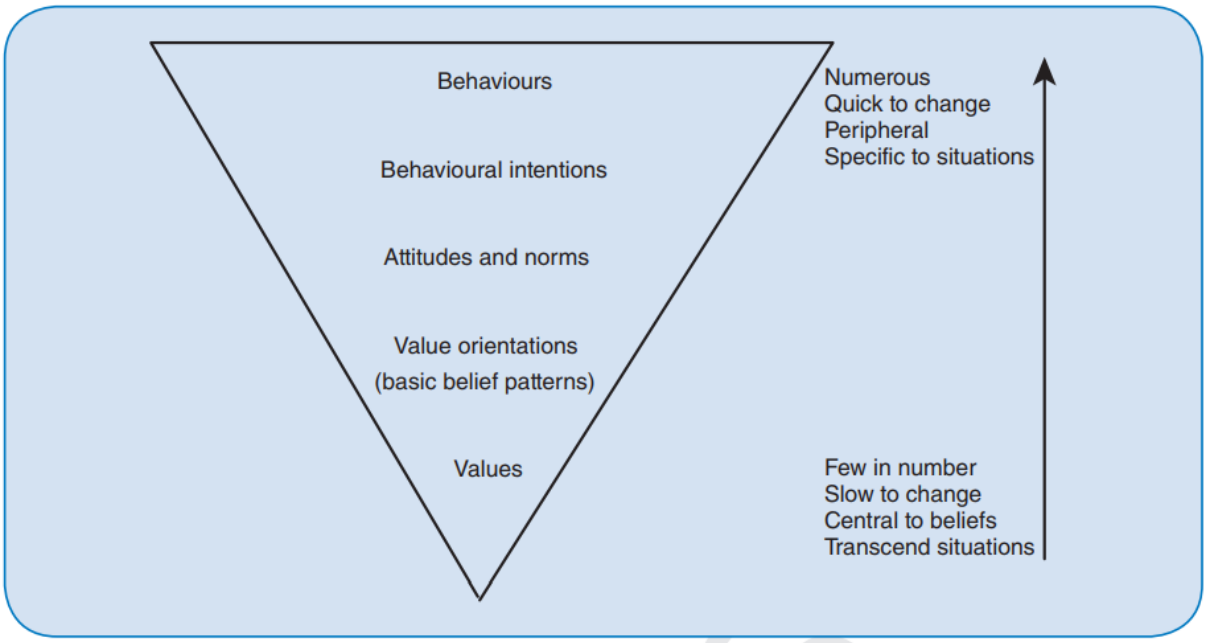

Figure 4: The cognitive hierarchy framework (Jacobs et al, 2012)

2.4.1. Wildlife value orientations and basic beliefs

In the work of Jacobs et al (2014) different kinds of basic beliefs are introduced which together form the wildlife value orientation of a person.Two predominant wildlife value orientations have been identified, being mutualism and domination (Jacobs et al, 2012; Teel and Manfredo, 2009; Manfredo et al., 2009; Manfredo, 2008; Fulton et al., 1996). People with a mutualism wildlife value orientation see wildlife as part of an extended family, deserving rights and care like humans. People with a domination wildlife value orientation are more likely to prioritise human well-being over wildlife well-being and they believe that wildlife should be managed and used for human benefit only. To assess these orientations a measurement instrument, consisting of 19 survey items, has been developed. In this measurement instrument the mutualism value orientation is based on two basic belief dimensions being caring beliefs and social affiliation beliefs, whereas the domination value orientation is based on two other basic belief dimensions being hunting beliefs and appropriate use beliefs. Out of these basic belief items combined indications are constructed to reflect the extent to which a respondent holds a mutualism and/or domination orientation towards wildlife (Jacobs et al., 2012).

Different combinations of these domination and mutualism orientations could then be used to translate people into traditionalists (high score on domination and low on mutualism), mutualists (high score on mutualism and low on domination), pluralists (score high on both scales), and distanced individuals (score low on both scales) as categorizations for the wildlife value orientations of persons (Teel and Manfredo, 2009). Although qualitive studies in Thailand, Malaysia, Mongolia, Estonia, China and the Netherlands and exploratory quantitative studies in ten European countries suggest that these four categorizations may exist in various cultures and might reflect salient beliefs that exist worldwide, conclusive evidence for the cross-cultural existence of these domination and mutualism typologies are largely absent (Jacobs et al, 2012; Teel et al., 2010). However, the reliability of the single two mutualism and domination orientations measurement instrument (with accompanying basic beliefs) has been demonstrated by quantitative research in the Netherlands, the United States of America, Germany and Denmark (Vaske, Jacobs and Sijtsma, 2011; Teel and Manfredo, 2009; Manfredo et al., 2009; Hermann, Voss, and Menzel, 2013; Gamborg & Jensen, 2016). Based on these research findings of the reliability of the scales and their predictive validity for more specific cognitions, these four studies demonstrate that the quantitative wildlife value orientation scales of domination and mutualism are applicable (Zainal and Jacobs, 2016).

Modern societies are undergoing a shift from focussing on economic well-being and safety (materialist values) to focussing on quality of life, belonging and self-actualisation (post-materialist values) which is associated with increasing education levels, income and urbanisation (Inglehart, 1997; Inglehart & Baker, 2000). It is suggested that these societal-level trends are contributing to an intergenerational shift from domination wildlife orientations to mutualism wildlife orientations (Teel and Manfredo, 2009; Manfredo et al., 2009). Data from nineteen Western states revealed that the percentage of those with a mutualism orientation was higher in states with a higher average state-level urbanisation, education and income. This suggests that ongoing demographic changes could contribute to a shift in wildlife value orientations from domination to mutualism (Jacobs et al, 2012). As the results of previous studies also revealed a strong relationship between wildlife-related behaviours and attitudes and wildlife value orientations, these shifts in trends may result in continued declines in public acceptance of traditional forms of wildlife management, such as hunting and lethal control of wildlife, that are typically acceptable for people with a domination orientation (Teel and Manfredo, 2009; Jacobs et al, 2012).

How useful researching wildlife value orientations is depends on the predictive validity of this concept, also towards other concepts. Wildlife value orientations should be able to

predict people their behaviours, norms and attitudes towards wildlife in specific situations (Jacobs et al., 2012). Studies have shown that wildlife value orientations are effective in predicting support for wildlife management interventions across various situations and issues and as well as in predicting behaviours such as wildlife viewing and hunting or other wildlife-related recreation activities (Jacobs et al., 2012; Whittaker et al., 2006; Teel and Manfredo, 2009; Fulton et al., 1996; Dougherty, Fulton and Anderson, 2003; Bright, Manfredo, and Fulton, 2000). These studies have consistently showed that people with a domination orientation are more likely to participate in fishing and hunting activities, while mutualist are more likely to participate in wildlife viewing based activities. Also, people with a domination value orientation are more likely than mutualists to support management interventions that favour human interests over wildlife protection or management interventions that harm wildlife (Jacobs et al., 2012; Teel and Manfredo, 2009). In general, these two wildlife value orientations and their accompanying basic beliefs explain approximately half of the variability in behaviours, norms and attitudes of people regarding wildlife (Jacobs et al., 2012; Whittaker et al., 2006; Jacobs et al., 2011; Fulton et al., 1996). Accordingly, continuing with work of Ballantyne, Packer and Falk (2011) and Zainal and Jacobs (2016), this theory will be used to see if it also can predict the variability in people their 1) future interest in nature, wildlife and environmental issues and 2) self-rated knowledge about wildlife conservation and engagement in environmentally responsible behaviours and motivations for wildlife species protection.

2.4.2. Future wildlife-based attitudes and beliefs

Looking at the second concept, people their future attitudes and behavior regarding wildlife-based recreation, it can also be studied with cognitive response theories like the cognitive hierarchy framework mentioned earlier. These theories state that beliefs and attitudes are not only based on general and specific values as mentioned before, but are also predictors of future behaviors and intentions (Hrubes, Ajzen and Daigle, 2001; Tarrant, Bright and Cordell, 1997). Although wildlife value orientations refer mostly to past beliefs and behaviors, it is assumed that they are relatively stable over time and can therefore serve as indications of likely future beliefs and behaviors (Hrubes, Ajzen and Daigle, 2001; Tarrant, Bright and Cordell, 1997). In other words, past and current beliefs and attitudes (based on the 19 wildlife value orientations questions) could predict future behaviors and intentions and to verify this will be studied with the help of some extra future intentions-based questions for the respondents.

These six questions are based on future interests which can give an extra dimension to the prediction of anticipated behavior (Hrubes, Ajzen and Daigle, 2001; Tarrant, Bright and Cordell, 1997). They will be based on investigating what the future plans of people are in terms of nature and wildlife and will give an indication how people view themselves in the future concerning these topics. It is assumed that participation in hunting, wildlife viewing and outdoor recreation like fishing are activities that are relatively stable over time and although reports of past and current behavior can serve as an indication of likely future behavior (Hrubes, Ajzen and Daigle, 2001; Tarrant, Bright and Cordell, 1997), an extra part in the questionnaire will ask some more specific questions about the future of people regarding wildlife to get more certainty of their future attitudes and to give this research the opportunity to see if the wildlife value orientations concept can predict variability in people their future wildlife attitudes and beliefs.

2.4.3. Wildlife conservation knowledge and support

Studying the third concept, peoples' wildlife conservation knowledge and support, with cognitive response theories will be based on the work of Ballantyne, Packer and Falk (2011). The questionnaire questions in their work are mainly about peoples' support towards wildlife conservation and although the work of Ballantyne, Packer and Falk (2011) comprises more questions on this topic a selection of it was taken and altered to match

the former two parts of the framework. Eight questions will, next to checking their wildlife knowledge, determine whether people are supporters of wildlife conservation, do not really care about it (neutral) or oppose to wildlife conservation.

Next to these eight questions, studying peoples' wildlife conservation support will also be based on an additional fifteen questions related to the protection of specific animal species based on the work of Zainal and Jacobs (2016). This will give an indication if there is a difference in the kind of wildlife people will support in protecting. Emotions toward wildlife species may play a role here as they influence almost all aspects of cognitions such as perception, attention, memory formation, motivation, but also play a big role in attitude formation (Jacobs et al, 2014). That is why besides cognitions towards wildlife also emotions towards wildlife are often studied as emotions play a big role in learning, decision making and memory formation and retrieval (Jacobs et al, 2012). Emotions towards wildlife can also have predictive potential for specific evaluations like the acceptability of management actions or future wildlife-based intentions and although emotions have biological determinants, culture and learning have proven to influence emotions as well (Jacobs et al, 2014). Mental dispositions learned by culture do effect for example the way emotional reactions are expressed in particular contexts, effect the interpretation of bodily emotional reactions, and effect which stimulus triggers an emotional reaction (Jacobs et al, 2012).

Most studies in emotions towards wildlife conservation address fear and studies have identified different fear dimensions by analyzing fear responses towards a variety of animals and results showed that different wildlife species and contexts gave different fear reactions and generate different emotions towards wildlife conservation (Jacobs et al, 2014). Three emotional categories can be taken from these previous studies: fear relevant animals, disgust relevant animals and fear-irrelevant animals. The fear relevant animals category consist of large carnivores that can potentially attack humans, in this study represented by bear, crocodile, eagle/hawk, shark and tiger. The disgust relevant animals category comprises smaller species that do normally not attack humans, but are feared nevertheless, in this research represented by bat, beetle, lizard, snake and spider. And the fear-irrelevant animals category contains herbivores and omnivores very unlikely to attack humans, in this study represented by dear, elephant, monkey, parakeet/parrot and wild boar. This discrete perspective of studying emotions based on fear result in emotional dispositions that can predict the acceptability of wildlife conservation in two gradational categories: from acceptance of a species' protection to no acceptance (Jacobs et al, 2014).

So in this research the overall concept of wildlife conservation knowledge and support will be determined by eight cognitive response questions and an additional fifteen emotional response questions in order to try to get an as good as possible picture of peoples' attitudes and beliefs towards wildlife conservation support and knowledge.

3. Methods

Based on the theoretical framework (see figure 3) and similar wildlife value orientations research in Malaysia by Zainal and Jacobs (2016) a structured questionnaire consisting out of close-ended 7-points continuous scales questions to assess wildlife value orientations, future nature based interests and conservation support, as well as demographics, was developed. The questionnaire was prepared in English and distributed to people visiting Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve in Singapore. The questionnaire was handed out to people either entering or leaving one of these two nature reserves with a simple request to voluntary participate in a study into human thought about wildlife. Completed questionnaires were collected by the researcher handing them out (myself in all cases) immediately after people finished the questionnaire, which often took them around 5 to 10 minutes to fill in. From around the 840 questionnaires distributed to people willing to fill it in, 820 complete ones were returned of which 410 in Bukit Timah as well as 410 in Sungei Buloh, resulting in an overall response rate of roughly 98% for handed out questionnaires in the two nature reserves combined.

According to Zainal and Jacobs (2016) in some cultures the applicability of 7-points continuous scales based questionnaires might be problematic due to a hesitance to opt for extreme answers, but this problem did not seem to appear in this research. Extreme answers in the data were checked if they made sense and also the normal distribution of the variables was checked through inspection of skewness and kurtosis in descriptive figures. In this thesis, there will not only be a focus on the Singapore case as a whole but also focus on the Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve subsamples. Comparisons between these two subsamples were made to contemplate whether findings are nature area specific or rather pertaining to Singaporean nature reserves in general. Also the demographic background of the visitors in relation to their wildlife value orientations was studied to see if for instance culture and upbringing have an effect on people their wildlife value orientations and therefore on their future wildlife based intentions and wildlife conservation support.

3.1. Independent and dependent variables

To the example of the work of Zainal and Jacobs (2016), nineteen items were used to assess the wildlife value orientations of domination and mutualism. Domination consists of 6 appropriate use belief items and 4 hunting belief items, whereas mutualism consists of 4 social affiliation belief items and 5 caring belief items. All these items were coded on a continuous 7-point scale ranging from -3 (strongly disagree) to +3 (strongly agree) with 0 as a neutral point. Six independent variables of wildlife value orientations were computed by averaging the scores of appropriate use beliefs (1), hunting beliefs (2), social affiliation beliefs (3), caring beliefs (4) and summing up the averages of appropriate use and hunting beliefs for the domination orientation (5) and the averages of social affiliation and caring beliefs for the mutualism orientation (6).

To assess the future wildlife based interests and conservation support of people visiting Singaporean nature areas, responses to future nature affiliation items and future nature use items as well as to wildlife conservation knowledge items and animal species protection items were used (29 statements in total). The first 14 statements were coded similarly to the independent variables, on 7-points scales ranging from -3 (strongly disagree) to +3 (strongly agree) with 0 as a neutral point. The last 15 statements (the animal species protection items) were also coded on 7-points scales but the range had a different meaning: -3 symbolized it to be very unimportant to protect an animal species and +3 symbolized it to be very important to protect an animal species, with 0 again as a neutral point. Here, six dependent variables were computed by averaging the scores of future nature affiliation items (1), future nature use items (2), wildlife conservation knowledge

items (3), animal species protection items (4) and summing up the averages of future nature affiliation and future nature use items for future nature based interests (5) and the averages of wildlife conservation knowledge and animal species protection items for conservation support (6).

3.2. Analysis

Similar to the study of Zainal and Jacobs (2016), reliability analyses ('Inter-item total correlation', 'Alpha if item deleted' and 'Cronbach's alpha') were used to check to what extent the statements of the wildlife value orientations and underlying basic beliefs measure the same constructs. These analyses were also used to check to what extent the items of future nature based interests and conservation support and their basic underlying thoughts measure the same constructs as well. In the results chapter of this thesis further explanation about these reliability analyses will be given. To estimate the predictive validity of peoples' wildlife value orientations in the assessment of their future nature based interests and conservation support, two regression models were used. The first model used domination and mutualism as predictors and the second model used the four basic beliefs of appropriate use, hunting, social affiliation and caring as predictors. The same analyses were conducted for the Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve samples separately. Again, in the results chapter of this study further explanation about the predictive validity analyses will be given.

3.2.1. Total sample size

The sample in total consists of 436 males (53,2%) and 384 females (46,8%) of which 101 people (12,3%) were teens, 237 persons (28,9%) were in their twenties, 156 people (19,0%) in their thirties, 121 persons (14,8%) in their forties, 118 people (14,4%) in their fifties, 73 persons (8,9%) in their sixties, 11 people (1,3%) in their seventies and 3 persons (0,3%) in their eighties. A total of 524 (63,9%) persons identified as Singaporean citizens and 296 (36,1%) persons were from foreign countries. Out of the overall sample 313 persons (38,2%) claimed to have no religious affiliation, 56 people (6,8%) were Muslim, 146 people (17,8%) were Buddhist, 250 people (30,5%) were Christian, 29 people (3,5%) were Hindu and 26 persons (3,2%) affiliated with other kinds of religions. Income also varied among the 820 persons that took the questionnaire: 396 people (48,3%) earned in between 0 to 2500 USD per month, 204 persons (24,9%) in between 2500 to 5000 USD, 81 people (9,9%) in between 5000 to 7500 USD, 56 persons (6,8%) in between 7500 to 10,000 USD and 83 (10.1%) people earned more than 10,000 USD per month. The most common highest level of education was college/university with 645 people (78,7%) out of the 820, apprenticeship/vocational education was done by 56 persons (6,8%), secondary school as highest level of education was done by 107 people (13,0%), primary school by 11 persons (1,3%) and only 1 person (0,1%) had no formal education at all.

Table 1: Descriptive and reliability analyses of wildlife value orientation items in Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve

Wildlife Value Orientation and basic belief dimension	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Domination					.76
Appropriate use beliefs					.76
Humans should manage wildlife and fish populations in such a way that human benefit	.37	2.11	.48	.74	
The needs of humans should take priority over wildlife and fish protection	-.76	1.89	.57	.71	
It is acceptable when people kill wildlife if they think it poses a threat to their life	.18	1.78	.50	.73	

It is acceptable when people kill wildlife if they think it poses a threat to their property	-.87	1.63	.58	.71	
It is acceptable to use wildlife and fish in research even if it may harm or kill some animals	-.49	1.68	.46	.74	
Wildlife and fish are on earth primarily for people to use	-1.57	1.63	.45	.74	
Hunting beliefs					.66
We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing	.07	1.87	.23	.73	
Hunting is cruel and inhumane to the animals [b]	-.94	1.85	.60	.47	
Hunting does not respect the lives of animals [b]	-.95	1.85	.60	.47	
People who want to hunt should be provided the opportunity to do so	-.66	1.67	.36	.64	
Mutualism					.88
Social affiliation beliefs					.80
We should strive for a world where humans and wildlife/fish can live side by side without fear	2.03	1.24	.45	.83	
I view all living things as part of one big family	1.96	1.27	.69	.73	
Animals should have rights similar to the rights of humans	1.18	1.65	.67	.74	
Animals are like my family and I want to protect them	1.44	1.39	.71	.71	
Caring beliefs					.85
I care about animals as much as I do care about other people	1.17	1.63	.62	.83	
It would be more rewarding for me to help animals rather than people	-.10	1.71	.54	.86	
I take great comfort in the relationships I have with animals	1.31	1.28	.74	.80	
I feel a strong emotional bond with animals	1.03	1.36	.77	.79	
I value the sense of companionship I receive from animals	1.37	1.27	.68	.81	

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Item was reverse coded prior to analysis

Table 2: Descriptive and reliability analyses of future nature interests and conservation support items in Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve

Future Nature Interests and Conservation Support	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Future Nature Interests					.51
Future Nature Affiliation					.84
I am interested to go watching wildlife in their natural habitat in the future	2.23	.94	.59	.83	
I am interested to visit nature areas in the future	2.47	.77	.69	.79	
I am interested to help protect nature and wildlife in the future	2.15	.94	.71	.78	
I am interested to learn more about nature and wildlife in the future	2.25	.87	.71	.78	
Future Nature Use					.65

I am interested to go fishing in the future	-.12	1.92	.49	.65	
I am interested to go hunting/trapping wildlife in the future	-1.81	1.54	.49	.65	
Conservation Support					.93
Wildlife Conservation Knowledge					.87
I am interested in learning about wildlife conservation	1.88	1.00	.67	.85	
I often think about whether my actions harm wildlife	1.47	1.22	.66	.85	
I search and look for information about wildlife conservation	.91	1.35	.70	.85	
I have knowledge about wildlife conservation	.75	1.29	.63	.86	
I do everything I can to protect and conserve wildlife	.65	1.46	.58	.86	
I understand the impact of my actions on wildlife conservation	1.40	1.19	.60	.86	
I am interested in finding out more about wildlife conservation	1.51	1.10	.67	.85	
I do my best to avoid doing things that might hurt or destroy wildlife habitat	2.02	1.00	.56	.86	
Animal Species Protection [b]					.95
1. Bat	1.51	1.40	.74	.94	
2. Bear	2.03	1.10	.72	.94	
3. Beetle	1.37	1.48	.70	.94	
4. Crocodile	1.55	1.39	.81	.94	
5. Deer	1.96	1.09	.68	.94	
6. Eagle/Hawk	2.18	.97	.73	.94	
7. Elephant	2.35	.93	.65	.94	
8. Lizard	1.26	1.59	.69	.94	
9. Monkey	1.74	1.25	.73	.94	
10. Parakeet/parrot	1.70	1.22	.77	.94	
11. Shark	2.09	1.17	.70	.94	
12. Snake	1.46	1.46	.78	.94	
13. Spider	1.15	1.66	.71	.94	
14. Tiger	2.30	1.06	.66	.94	
15. Wild boar	1.69	1.33	.73	.94	

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Items were coded on 7-point scales ranging from -3 (very unimportant) to +3 (very important)

3.2.2. Bukit Timah Nature Reserve sample

The Bukit Timah Nature Reserve sample consists of 203 males (49,5%) and 207 females (50,5%) of which 67 people (16,3%) were teens, 120 persons (29,3%) were in their twenties, 53 people (12,9%) in their thirties, 50 persons (12,2%) in their forties, 68 people (16,6%) in their fifties, 46 persons (11,2%) in their sixties, 5 people (1,2%) in their seventies and 1 person (0,2%) was between eighty and ninety. A total of 306 (74,6%) persons identified as Singaporean citizens and 104 (25,4%) persons were from foreign countries. Out of the overall sample 139 persons (33,9%) claimed to have no religious affiliation, 26 people (6,3%) were Muslim, 70 people (17,1%) were Buddhist, 148 people (36,1%) were Christian, 12 people (2,9%) were Hindu and 15 persons (3,7%) affiliated with other kinds of religions. Income also varied among the 410 persons that took the questionnaire: 238 people (58,0%) earned in between 0 to 2500 USD per month, 68 persons (16,6%) in between 2500 to 5000 USD, 40 people (9,8%) in between 5000 to 7500 USD, 26 persons (6,3%) in between 7500 to 10,000 USD and 38 (9,3%) people earned more than 10,000 USD per month. The most common highest level of education was college/university with 301 people (73,4%) out of the 410, apprenticeship/vocational education was done by 33 persons (8,0%), secondary school as highest level of education

was done by 71 people (17,3%), primary school by 4 persons (1,0%) and only 1 person (0,2%) had no formal education at all.

Table 3: Descriptive and reliability analyses of wildlife value orientation items in Bukit Timah Nature Reserve only

Wildlife Value Orientation and basic belief dimension	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Domination					.78
Appropriate use beliefs					.79
Humans should manage wildlife and fish populations in such a way that human benefit	.58	2.11	.52	.76	
The needs of humans should take priority over wildlife and fish protection	-.71	1.92	.57	.74	
It is acceptable when people kill wildlife if they think it poses a threat to their life	.22	1.81	.57	.75	
It is acceptable when people kill wildlife if they think it poses a threat to their property	-.82	1.67	.57	.75	
It is acceptable to use wildlife and fish in research even if it may harm or kill some animals	-.49	1.71	.51	.76	
Wildlife and fish are on earth primarily for people to use	-1.39	1.70	.48	.77	
Hunting beliefs					.69
We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing	.24	1.83	.28	.74	
Hunting is cruel and inhumane to the animals [b]	-1.04	1.88	.61	.52	
Hunting does not respect the lives of animals [b]	-1.02	1.87	.63	.51	
People who want to hunt should be provided the opportunity to do so	-.60	1.68	.34	.67	
Mutualism					.90
Social affiliation beliefs					.83
We should strive for a world where humans and wildlife/fish can live side by side without fear	2.05	1.22	.53	.83	
I view all living things as part of one big family	1.94	1.32	.69	.77	
Animals should have rights similar to the rights of humans	1.13	1.73	.70	.77	
Animals are like my family and I want to protect them	1.37	1.48	.72	.75	
Caring beliefs					.87
I care about animals as much as I do care about other people	1.19	1.67	.68	.85	
It would be more rewarding for me to help animals rather than people	-.05	1.74	.54	.89	
I take great comfort in the relationships I have with animals	1.26	1.34	.79	.83	
I feel a strong emotional bond with animals	.96	1.45	.81	.82	
I value the sense of companionship I receive from animals	1.31	1.34	.73	.84	

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Item was reverse coded prior to analysis

Table 4: Descriptive and reliability analyses of future nature interests and conservation support items in Bukit Timah Nature Reserve only

Future Nature Interests and Conservation Support	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Future Nature Interests					.55
Future Nature Affiliation					.84
I am interested to go watching wildlife in their natural habitat in the future	2.13	1.00	.55	.85	
I am interested to visit nature areas in the future	2.43	.81	.70	.79	
I am interested to help protect nature and wildlife in the future	2.08	.99	.73	.77	
I am interested to learn more about nature and wildlife in the future	2.19	.92	.73	.77	
Future Nature Use					.62
I am interested to go fishing in the future	.04	1.99	.46	.62	
I am interested to go hunting/trapping wildlife in the future	-1.70	1.65	.46	.62	
Conservation Support					.94
Wildlife Conservation Knowledge					.88
I am interested in learning about wildlife conservation	1.84	1.05	.67	.86	
I often think about whether my actions harm wildlife	1.46	1.21	.70	.85	
I search and look for information about wildlife conservation	.86	1.37	.73	.85	
I have knowledge about wildlife conservation	.76	1.30	.63	.86	
I do everything I can to protect and conserve wildlife	.56	1.54	.55	.87	
I understand the impact of my actions on wildlife conservation	1.36	1.24	.59	.86	
I am interested in finding out more about wildlife conservation	1.50	1.14	.67	.86	
I do my best to avoid doing things that might hurt or destroy wildlife habitat	2.02	1.00	.58	.87	
Animal Species Protection [b]					.95
1. Bat	1.49	1.44	.75	.94	
2. Bear	1.94	1.17	.74	.94	
3. Beetle	1.39	1.47	.68	.94	
4. Crocodile	1.42	1.46	.81	.94	
5. Deer	1.92	1.11	.67	.94	
6. Eagle/Hawk	2.11	1.00	.74	.94	
7. Elephant	2.29	.97	.66	.94	
8. Lizard	1.20	1.65	.65	.94	
9. Monkey	1.68	1.25	.74	.94	
10. Parakeet/parrot	1.67	1.20	.76	.94	
11. Shark	2.03	1.21	.71	.94	
12. Snake	1.43	1.46	.78	.94	
13. Spider	1.11	1.73	.70	.94	
14. Tiger	2.18	1.16	.70	.94	
15. Wild boar	1.59	1.38	.74	.94	

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Items were coded on 7-point scales ranging from -3 (very unimportant) to +3 (very important)

3.2.3. Sungei Buloh Wetland Reserve sample

The Sungei Buloh Wetland Reserve sample consists of 233 males (56,8%) and 177 females (43,2%) of which 34 people (8,3%) were teens, 117 persons (28,5%) were in their twenties, 103 people (25,1%) in their thirties, 71 persons (17,3%) in their forties, 50 people (12,2%) in their fifties, 27 persons (6,6%) in their sixties, 6 people (1,5%) in their seventies and 2 persons (0,4%) were between eighty and ninety. A total of 218 (53,2%) persons identified as Singaporean citizens and 192 (46,8%) persons were from foreign countries. Out of the overall sample 174 persons (42,4%) claimed to have no religious affiliation, 30 people (7,3%) were Muslim, 76 people (18,5%) were Buddhist, 102 people (24,9%) were Christian, 17 people (4,1%) were Hindu and 11 persons (2,8%) affiliated with other kinds of religions. Income also varied among the 410 persons that took the questionnaire: 158 people (38,5%) earned in between 0 to 2500 USD per month, 136 persons (33,2%) in between 2500 to 5000 USD, 41 people (10,0%) in between 5000 to 7500 USD, 30 persons (7,3%) in between 7500 to 10,000 USD and 45 (11,0%) people earned more than 10,000 USD per month. The most common highest level of education was college/university with 344 people (83,9%) out of the 410, apprenticeship/vocational education was done by 23 persons (5,6%), secondary school as highest level was done by 36 people (8,8%), primary school by 7 persons (1,7%) and no one had no formal education

Table 5: Descriptive and reliability analyses of wildlife value orientation items in Sungei Buloh Wetland Reserve only

Wildlife Value Orientation and basic belief dimension	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Domination					.73
Appropriate use beliefs					.73
Humans should manage wildlife and fish populations in such a way that human benefit	.17	2.09	.43	.72	
The needs of humans should take priority over wildlife and fish protection	-.81	1.85	.57	.67	
It is acceptable when people kill wildlife if they think it poses a threat to their life	.14	1.74	.44	.71	
It is acceptable when people kill wildlife if they think it poses a threat to their property	-.92	1.60	.60	.66	
It is acceptable to use wildlife and fish in research even if it may harm or kill some animals	-.49	1.65	.40	.72	
Wildlife and fish are on earth primarily for people to use	-1.75	1.54	.41	.71	
Hunting beliefs					.63
We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing	-.10	1.90	.19	.72	
Hunting is cruel and inhumane to the animals [b]	-.85	1.81	.58	.42	
Hunting does not respect the lives of animals [b]	-.88	1.84	.58	.43	
People who want to hunt should be provided the opportunity to do so	-.72	1.65	.34	.61	
Mutualism					.86
Social affiliation beliefs					.78
We should strive for a world where humans and wildlife/fish can live side by side without fear	2.00	1.26	.36	.83	

I view all living things as part of one big family	1.98	1.21	.69	.68	
Animals should have rights similar to the rights of humans	1.24	1.55	.63	.70	
Animals are like my family and I want to protect them	1.51	1.29	.69	.67	
Caring beliefs					.82
I care about animals as much as I do care about other people	1.14	1.60	.56	.80	
It would be more rewarding for me to help animals rather than people	-.16	1.69	.54	.81	
I take great comfort in the relationships I have with animals	1.36	1.20	.68	.77	
I feel a strong emotional bond with animals	1.11	1.27	.73	.75	
I value the sense of companionship I receive from animals	1.43	1.19	.62	.78	

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Item was reverse coded prior to analysis

Table 6: Descriptive and reliability analyses of future nature interests and conservation support items in Sungei Buloh Wetland Reserve only

Future Nature Interests and Conservation Support	Mean	Standard Deviation	Inter-item total correlation	Alpha if item deleted	Cronbach's alpha
Future Nature Interests					.48
Future Nature Affiliation					.84
I am interested to go watching wildlife in their natural habitat in the future	2.32	.87	.65	.80	
I am interested to visit nature areas in the future	2.51	.74	.67	.79	
I am interested to help protect nature and wildlife in the future	2.22	.89	.68	.79	
I am interested to learn more about nature and wildlife in the future	2.31	.83	.68	.79	
Future Nature Use					.68
I am interested to go fishing in the future	-.27	1.85	.53	.62	
I am interested to go hunting/trapping wildlife in the future	-1.93	1.43	.53	.62	
Conservation Support					.93
Wildlife Conservation Knowledge					.87
I am interested in learning about wildlife conservation	1.92	.95	.66	.85	
I often think about whether my actions harm wildlife	1.47	1.24	.61	.85	
I search and look for information about wildlife conservation	.97	1.33	.67	.85	
I have knowledge about wildlife conservation	.75	1.28	.63	.85	
I do everything I can to protect and conserve wildlife	.74	1.38	.60	.85	
I understand the impact of my actions on wildlife conservation	1.44	1.14	.61	.85	
I am interested in finding out more about wildlife conservation	1.53	1.07	.67	.85	
I do my best to avoid doing things that might hurt or destroy wildlife habitat	2.03	.99	.54	.86	
Animal Species Protection [b]					.95
1. Bat	1.53	1.36	.74	.94	
2. Bear	2.12	1.01	.69	.94	

3. Beetle	1.36	1.48	.73	.94
4. Crocodile	1.69	1.29	.81	.94
5. Deer	1.99	1.06	.68	.94
6. Eagle/Hawk	2.25	.93	.71	.94
7. Elephant	2.41	.89	.64	.94
8. Lizard	1.33	1.53	.74	.94
9. Monkey	1.80	1.25	.72	.94
10. Parakeet/parrot	1.73	1.24	.78	.94
11. Shark	2.14	1.12	.69	.94
12. Snake	1.50	1.46	.78	.94
13. Spider	1.18	1.59	.72	.94
14. Tiger	2.43	.93	.63	.94
15. Wild boar	1.80	1.27	.70	.94

[a] Items were coded on 7-point scales ranging from -3 (strongly disagree) to +3 (strongly agree)
[b] Items were coded on 7-point scales ranging from -3 (very unimportant) to +3 (very important)

3.3. Demographics and wildlife value orientations

3.3.1. Influence of demographic background

This part looks into the relation between people their demographic background and their wildlife value orientations. Can age, gender, origin, education, religion and income of people influence their wildlife value orientations? It probably will but comparing these different background demographics of people is difficult as their relation to wildlife value orientations and basic beliefs is calculated with different statistical models in SPSS. For instance, age and income can be calculated with regression analysis towards wildlife value orientations, whereas origin, education and religion are calculated with an one-way ANOVA analysis and gender with a T-test analysis. Putting all these different demographics into a table results in table 7. What becomes immediately clear is the fact that both age and gender do not seem to have any influence on people their wildlife value orientations and basic beliefs. This could have something to do with the fact that wildlife value orientations are high order cognitions which are central to beliefs and which might transcend basic features like age and gender (see the theoretical framework).

However, in the case of the other demographics the situation is different. Starting with the demographic whether the respondents are from foreign countries (most of them are tourists visiting Singapore) or if they are from Singapore (local), it looks like this plays a significant role in people their wildlife value orientations and basic beliefs. Although it is not possible to compare different countries with each other due to the fact that most of those countries are not represented by enough respondents to be able to do meaningful statistical analysis, it is possible to research the dichotomy between foreign (mostly tourists) and local people. Especially the mutualism orientation gets influenced strongly by whether people are tourists or locals and to a lesser extent this also applies to the social affiliation belief and caring belief of people. Also the appropriate use belief is affected a little by this dichotomy.

The second demographic of people that significantly influences their wildlife value orientations and basic beliefs is the level of education people have had. Here the mutualism orientation and caring belief are significantly affected by the level of education people have had, however all the other orientations and beliefs seem not to be affected. Continuing on to the demographic of people their religious affiliation, it becomes evident that this demographic does not influence peoples' wildlife value orientations or basic beliefs in total, but it does seem to have an effect on most singular beliefs and orientations. Especially the hunting belief seems to be strongly connected to people their religion. To a lesser extent this also applies to the appropriate use and caring belief and the domination and mutualism orientations which are all significantly influenced by religion too. However, it is hard to say based on the dataset of this research which religion has what kind of influence on the

beliefs and orientations of people, because not all religions are represented by enough respondents to be able to do statistical analysis for meaningful outcomes.

For the last demographic, the monthly income of people, it seems only to significantly influence the mutualism orientation and caring belief, but not much more. Overall, it is hard to say on the basis of this analysis as shown in table 7 what the exact relation is between the background demographics (and culture) of people and their wildlife value orientations and basic wildlife beliefs. In some cases it is evident that these demographics do have significant influence on the wildlife value orientations and basic beliefs of people, but more research and a better representative dataset for the different countries and religions in the world is needed to be able to research better the relations between background demographics and wildlife value orientations.

Table 7: Background demographics in relation to wildlife value orientations and basic beliefs of visitors of Bukit Timah and Sungei Buloh grouped together

Model variable	*Wildlife value orientations*	Domination	Mutualism	*Basic beliefs*	Appropriate use	Hunting	Social Affiliation	Caring
Background demographic (F-values)	Total	Total	Total	Total	Total	Total	Total	Total
Age (Regression)	.02	1.00	.70	.02	3.66	.06	.41	4.40
Gender (T-test)	.13	.78	.66	.13	.72	1.63	.16	.89
Singaporean or foreign (one-way ANOVA)	1.58 *	1.15	2.04 ***	1.58 *	1.44 *	1.19	1.85 **	1.78 **
Level of education (one-way ANOVA)	2.75 *	.81	2.65 *	2.75 *	.60	1.61	1.85	2.85 *
Religious affiliation (one-way ANOVA)	1.45	2.01 *	1.85 *	1.45	1.92 *	2.24 **	1.54	1.84 *
Monthly income in US dollars (Regression)	2.48	.15	4.37 *	2.48	.80	2.16	1.76	5.87 *

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

3.3.2. Location comparability

As is established before, the dataset is big enough for location comparison between Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve. However, it needs to be checked first if these two areas are also comparable in terms of people their demographic background. Table 8 shows the means of the demographic background indicators and the significance levels of them between the two nature areas. The results show that the two areas are only comparable in terms of visitors' religious affiliation and their monthly income in US dollars as there is no significant difference of these two indicators between the visitors of Bukit Timah and Sungei Buloh. But for the indicators age, gender, home country and educational level there are significant differences between the visitors of the two nature

areas. This makes comparing the demographic impact on the wildlife value orientations of visitors of the two parks only useful between the last two indicators, in contrast to the first four indicators which are significantly different.

Table 8: Means of people their demographic background per nature reserve

Model independent variable	Location	Mean	Significance
Age	Bukit Timah Nature Reserve	3.23	.00
	Sungei Buloh Wetland Reserve	3.25	
Gender	Bukit Timah Nature Reserve	.50	.01
	Sungei Buloh Wetland Reserve	.43	
Singaporean or foreign	Bukit Timah Nature Reserve	6.16	.00
	Sungei Buloh Wetland Reserve	10.72	
Level of education	Bukit Timah Nature Reserve	4.53	.00
	Sungei Buloh Wetland Reserve	4.72	
Religious affiliation	Bukit Timah Nature Reserve	2.97	.94
	Sungei Buloh Wetland Reserve	2.62	
Monthly income in US dollars	Bukit Timah Nature Reserve	1.92	.63
	Sungei Buloh Wetland Reserve	2.19	

Thus, the first four indicators of the demographic background of people differ significantly too much between the visitors of Bukit Timah and Sungei Buloh. Therefore, the differences in the relation of these indicators and peoples' wildlife value orientations between the two nature areas cannot be given with certainty. This is unfortunate because analysis shows some major differences in these four indicators between the two areas, like for instance the influence of age on the appropriate use belief and the caring belief of the visitors of Bukit Timah versus those of Sungei Buloh, or the influence of where somebody is from (tourist or local) on the mutualism orientation, hunting belief, social affiliation belief and caring belief of the visitors of Bukit Timah versus those of Sungei Buloh, or the level of education on the caring belief of the visitors of Bukit Timah versus those of Sungei Buloh. All of these results cannot be determined as reliable outcomes between the two areas.

For the last two indicators this is a different story, here the differences between the two parks are deemed a direct result from different influences of the background demographics on people their wildlife value orientations and not as a result of different demographics to begin with. The religious affiliation of visitors of Bukit Timah has an significant influence on their appropriate use belief, whereas the religious affiliation of visitors of Sungei Buloh has an significant influence on their mutualism orientation, hunting belief and caring belief. Why these completely different influences exist between the visitors of these two parks is hard to say, but it can be said with certainty that it cannot be a result of significantly different religious affiliations between the two cases. Even bigger differences between the two cases are for the monthly income indicator. Here the influence of this indicator in the Bukit Timah sample appears to be far greater than in the Sungei Buloh sample. The influence of income on the wildlife value orientations of the visitors of Bukit Timah is apparent for domination and mutualism orientations as well as for hunting, social affiliation and caring beliefs, whereas this is not the case for the visitors of Sungei Buloh. Why such big differences can appear between two seemingly comparable cases is difficult to say

based on only the data of table 9. Further research needs to be done on the exact influence of these demographics on people their wildlife value orientations and then it might be possible to come with answers as why these two nature areas differ so much in terms of influence of those two demographic factors.

Table 9: Background demographics in relation to wildlife value orientations and basic beliefs of visitors of Bukit Timah (B.T.) versus visitors of Sungei Buloh (S.B.)

Model variable	*Wildlife value orientations*		Domination		Mutualism		*Basic beliefs*		Appropriate use		Hunting		Social Affiliation		Caring	
Background demographic (F-values)	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.	B.T.	S.B.
Age (Regression)	.01	.02	2.15	.06	1.75	.16	.01	.02	4.62 *	.13	.08	.52	.07	1.94	4.45 *	.42
Gender (T-test)	.10	.34	1.99	.16	.17	.10	.10	.34	1.29	.00	1.64	.22	.25	.06	.05	.84
Singaporean or foreign (one-way ANOVA)	1.29	1.35	1.33	1.09	1.50	1.91 **	1.29	1.35	1.05	1.38	1.74 *	1.06	1.69 *	2.01 **	1.25	1.50 *
Level of education (one-way ANOVA)	1.60	2.11	.64	.80	2.16	1.40	1.60	2.11	.48	.22	1.23	1.25	2.08	1.11	1.70	2.98 *
Religious affiliation (one-way ANOVA)	1.01	1.28	1.44	1.56	.97	1.93 *	1.01	1.28	1.84 *	.77	1.32	2.26 *	.85	1.47	1.13	2.25 *
Monthly income in US dollars (Regression)	.14	3.63	3.99 *	1.96	5.45 *	.38	.14	3.63	.33	2.80	7.15 **	.37	4.56 *	.09	4.45 *	1.87

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

4. Results

4.1. Reliabilities

4.1.1. Wildlife value orientations and basic beliefs

The tables in the methods-chapter illustrated that the reliabilities of the two wildlife value orientations scales of domination and mutualism were acceptable for the complete nature area case as well as for the two separate cases of Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve. All Cronbach's alphas exceeded the generally accepted cut-off point of .65 as an Cronbach's alpha of .65 to .70 is often considered an adequate scale in parks, recreation and human dimension research (Vaske, 2008). But some researchers use a cut-off point of .80 for a good scale while other researchers are satisfied with the usage of .60 as an acceptable cut-off point (Vaske, 2008). In terms of the four basic belief scales of wildlife value orientations, reliabilities were also acceptable for the complete nature area case as well as for the Bukit Timah Nature Reserve case as, again, all Cronbach's alphas exceeded the normally excepted .65 cut-off point. Only the hunting belief item of the Sungei Buloh Wetland Reserve sample proved to be a little less reliable when using the .65 cut-off point because the Cronbach's alpha in this case was .63. The other three basic beliefs of the Sungei Buloh Wetland Reserve sample did exceed the normally excepted .65 cut-off point. Due to the fact that the hunting belief of the Sungei Buloh sample is the only wildlife value orientation sub concept that does not meet the stricter requirement according to Vaske (2008), although just by .02, it has resulted in a reconsideration of the reliability cut-off point of .65. In this case it is deemed acceptable to set reliability at a cut-off point of .60 in order to still be able to compare the results of the hunting belief.

The inter item-total correlations of the 19 statements of the wildlife value orientations concept proved to be reliable within their sub concepts as almost all of them did exceed the .40 cut-off point for reliability (Vaske, 2008). The only ones that did not were the first and last statement of the hunting belief item in all three cases: the total nature area case and the two separate nature reserve cases. As the inter item-total correlations of these two statements of the hunting belief sub concept proves to be unreliable in these three cases, an explanation for it is valuable. Especially because the wildlife value orientations concept has proven its reliability in other cases all over the world (Jacobs et al, 2014).

Proven that the hunting belief sub concept in terms of Cronbach's alpha values, as well as for the inter item-total correlation values, are relatively low especially compared to the other belief sub concepts, resulted in an inspection of the correlation matrix of the underlying statements. Comparable to the results of the research of Zainal and Jacobs (2016), the correlation between the statements "Hunting is cruel and inhumane to the animals" and "Hunting does not respect the lives of animals" was .87 and the correlation between the statements "We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so" was .33. But all other correlations across the four hunting statements were relatively low, in between .12 to .26. To better uncover this cluster of related variables (or factors) in a larger set of variables, exploratory factor analysis with Varimax rotation to measure the factorial construct validity of the four hunting belief statements was done. This revealed two dimensions with Eigenvalues (the variances of the factors: the larger the Eigenvalue, the more of the variance in the statements/items is explained by the factor, Vaske 2008) higher than 1, grouping the statements/items in the same way as in the correlation matrix came forward. This, together with explained variances of 52% and 29% in these two dimensions, suggests that the hunting statements might reflect a two dimensional construct in this Singaporean based sample. Based on the exact same results which came forward in similar research done in Malaysia (Zainal and Jacobs, 2016), it can be stated that the first construct relates to the consequences of hunting for wildlife (involving statements "Hunting is cruel and inhumane to the animals"

and "Hunting does not respect the lives of animals"), whereas the second construct relates to hunting opportunities for humans (involving statements "We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so").

Looking further into the inter item-total correlations of the wildlife value orientations, in the Sungei Buloh Wetland Reserve case the first statement of the social affiliation belief did also not meet the .40 cut-off point for reliability, although only by a .04 difference. However, as it did exceed this cut-off point in the Bukit Timah Nature Reserve case, as well as in the total nature area case, this statement will be treated as reliable within the social affiliation belief item and dropping this statement from the scale is not considered relevant and useful.

Overall in terms of consistencies of reliability, it can be concluded that in all three cases the internal consistencies of the mutualism scale and its associated basic beliefs of social affiliation and caring were higher than the consistencies of the domination scale and its associated beliefs of appropriate use and hunting, which is similar to the Malaysian research of Zainal and Jacobs (2016).

4.1.2. Future nature interests and conservation support

Analysing the reliability of the second concept, Future Nature Interests, showed that it did not meet Cronbach's alpha cut-off point of .65 in any of the three cases and seemed not to be reliable as a complete concept. Therefore, inspecting the correlation matrix of the underlying statements was needed and the correlation between the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future" was .49, while the correlations between the other four statements of this concept were all between .48 and .71. But all other correlations between the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future" and the other four statements of the Future Nature Interest concept were a lot lower, between -.18 and .05. On top of that, exploratory factor analysis with Varimax rotation over the six Future Nature Interests statements revealed the same two dimensions with Eigenvalues higher than 1, as already illustrated by the correlation matrix. This in combination with explained variances of 46% and 25% of the two dimensions suggests that the Future Nature Interests statements might reflect a two dimensional construct in this Singaporean sample. The first construct relates to future nature affiliation based interests (involving statements "I am interested to go watching wildlife in their natural habitat in the future", "I am interested to visit nature areas in the future", "I am interested to help protect nature and wildlife in the future" and "I am interested to learn more about nature and wildlife in the future"), whereas the second construct relates to future nature usage based interests (involving the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future"). The creation of these two sub concepts of Future Nature Interests resulted in higher Cronbach's alphas exceeding the cut-off point in all three cases for Future Nature Affiliation and do as well in the overall nature area case and Sungei Buloh case regarding the Future Nature Use concept. Only in Bukit Timah the Future Nature Use concept remains a little lower with a Cronbach's alpha of .62. But due to a small .03 difference and to keep the possibility of comparison between the Bukit Timah and Sungei Buloh case, a reconsideration to bring down the reliability cut-off point to .60 is deemed acceptable. The inter item-total correlation of each statement per sub concept proved also that each of these statements of the sub concepts are reliable as they all did exceed the .40 cut-off point.

Lastly, looking at the reliability of the third concept, Conservation Support, it can be concluded that in all three cases the .65 Cronbach's alpha cut-off point was easily met and exceeded. But as this overall concept consists of 23 statements in total it is argued that it

might be good to split the concept into two sub concepts as two different parts could be distinguished in the questionnaire. The first part comprises 8 statements based on wildlife conservation knowledge, whereas the second part is about whether people thought 15 specific animal species should be protected or not. As these two parts contain different kinds of statements based on different aspects within the Conservation Support concept, reliability of the Wildlife Conservation Knowledge sub concept and Animal Species Protection sub concept were also checked. These results showed even higher Cronbach's alpha values than for the Conservation Support concept as a whole, exceeding the .65 cut-off point in all three separate cases. Exploratory factor analysis with Varimax rotation showed that this split into two sub concepts was proven correct and analysing the inter item-total correlation of each statement per sub concept proved that each of these statements are reliable as they all did exceed the .40 cut-off point.

It can be concluded that in all three cases the internal consistencies of the Conservation Support concept and its associated sub concepts of Wildlife Conservation Knowledge and Animal Species Protection were higher than the consistencies of the Future Nature Interests concept and its associated sub concepts of Future Nature Affiliation and Future Nature Use.

4.2. Predictive Validity of Wildlife Value Orientations

4.2.1. Total sample size

4.2.1.1. Validity main concepts

The wildlife value orientations model as well as the basic beliefs model can predict future nature interests and conservation support of the visitors of Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve to a certain extent. The wildlife value orientations model, based on domination and mutualism as independent variables, predicted 12% of the variability of peoples future nature interests and 25% of the variability of peoples conservation support. These effect sizes can be described as a typical relationship in the case of the concept of future nature interests and as a substantial relationship in the case of the concept of conservation support (Vaske, 2008), or medium effect size and large effect size as Cohen (1988) labels them. In the case of peoples future nature interests the domination variable proved to be a better predictor than the mutualism variable and in the case of peoples conservation support the mutualism variable proved to be a better predictor than the domination variable.

The basic beliefs model, based on appropriate use, hunting, social affiliation and caring beliefs as independent variables, predicted also 12% of the variability of peoples future nature interests but even 27% of the variability of peoples conservation support. Again, these effect sizes can be described as a typical relationship in the case of the concept of future nature interests and as a substantial relationship in the case of the concept of conservation support (Vaske, 2008), or medium effect size and large effect size according to Cohen (1988) labels. The hunting belief proved to be the best predictor in the case of peoples future nature interests and the social affiliation belief proved to be the best predictor in the case of peoples conservation support (where the hunting belief did not even manage to get a significant result).

In comparison, the on basic beliefs based model predicted peoples future nature interests and conservation support better than the model based on wildlife value orientations. However, as the future nature interests concept proved to be not reliable enough and the conservation support concept is build out of two parts that differ in terms of their statements and scope, it is more useful to look at the predictive validity towards the four sub concepts (future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection), instead of the two main concepts.

4.2.1.2. Validity sub concepts

Consequently, looking at the two sub concepts of future nature interests, the wildlife value orientations model predicted 20% of the variability of peoples future nature affiliation (typical relationship or medium effect size) and 14% of the variability of peoples future nature use (typical relationship or medium effect size). Mutualism is a lot better in predicting peoples future nature affiliation than domination is (not even significant), whereas domination in its turn is a lot better in predicting peoples future nature use than mutualism is (not significant as well). Analysing the two sub concepts of conservation support with the wildlife value orientations model resulted in a 31% prediction of the variability of peoples wildlife conservation knowledge (substantial relationship or large effect size) and 9% of the variability of peoples view on animal species protection (minimal relationship or small effect size). For both the sub concepts wildlife conservation knowledge and animal species protection, mutualism proved to be a better predictor than domination.

Analysing the four sub concepts from the basic beliefs model point of view, 21% of the variability of peoples future nature affiliation (typical relationship or medium effect size) was predicted by this model and again 14% of the variability of peoples future nature use (typical relationship or medium effect size). The social affiliation belief proved to be the best predictor of peoples future nature affiliation and the hunting belief predicts best peoples future nature use (where social affiliation and caring beliefs could not provide significant results at all). This basic beliefs model predicts 32% of the variability of the wildlife conservation knowledge sub concept (substantial relationship or large effect size) and 12% of the variability of the animal species protection sub concept (typical relationship or medium effect size). The caring belief is best in predicting peoples wildlife conservation knowledge, whereas the appropriate use belief is best in predicting peoples view on animal species protection. The hunting belief turned out to be not significant for both of these sub concepts and therefor useless as a predictor for them and in the case of the animal species protection sub concept caring beliefs was also not significant and useless as a predictor.

Overall, the model based on basic beliefs predicted peoples future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection better than the wildlife value orientations based model. Splitting up the two main concepts of future nature interests and conservation support did come at a price as not all basic beliefs or value orientations turned out to be significant anymore regarding the four sub concepts. But the predictive validity in general was significant and effect sizes were from a higher level than in the case of the two main concepts of which the reliability is questionable to begin with.

Table 10: Wildlife value orientations predicting future nature interests and conservation support of visitors of Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve

Model variable	***Future nature interests***		**Future nature affiliation**		**Future nature use**		***Conservation support***		**Wildlife conservation knowledge**		**Animal species protection**	
	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2
Wildlife value orientations		.12 ***		.20 ***		.14 ***		.25 ***		.31 ***		.09 ***
Domination	.36 ***		-.01		.40 ***		-.12 ***		-.06 *		-.13 ***	
Mutualism	.24 ***		.45 ***		.04		.45 ***		.53 ***		.23 ***	
Basic beliefs		.12 ***		.21 ***		.14 ***		.27 ***		.32 ***		.12 ***
Appropriate use	.14 ***		-.09 **		.19 ***		-.19 ***		-.09 **		-.23 ***	
Hunting	.31 ***		.08 *		.29 ***		.05		.01		.07	
Social Affiliation	.14 **		.27 ***		.02		.27 ***		.28 ***		.18 ***	

Caring	.12 **	.23 ***	.02	.23 ***	.31 ***	.08

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

4.2.1.3. Location comparability

As the dataset is big enough to allow location comparison between Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve and as this will give an extra dimension to this research, it is important to check if the two areas are comparable to start with (Vaske, 2008). Looking at the means of the wildlife value orientations and basic beliefs and the significance levels of them between these two areas, the conclusion can be made that the areas are indeed comparable in terms of visitors their wildlife value orientations and basic beliefs (see table 11). Only the appropriate use belief has a little significant difference between the two locations which can mean that in this specific belief there is a significant difference between the appropriate use beliefs of the visitors of both parks. However, for the sake of comparison the means will be treated as equal to make it possible to compare all basic beliefs with each other. In the next two subchapters the nature reserves will be investigated apart from each other and later on they will be compared to see if there are any significant differences between the two and if so, what the reasons might be for these differences.

Table 11: Means of the Wildlife Value Orientations and Basic Beliefs per nature reserve

Model independent variable	Location	Mean	Significance
Domination beliefs	Bukit Timah Nature Reserve	-.52	.13
	Sungei Buloh Wetland Reserve	-.62	
Mutualism beliefs	Bukit Timah Nature Reserve	1.28	.46
	Sungei Buloh Wetland Reserve	1.33	
Appropriate use beliefs	Bukit Timah Nature Reserve	-.43	.04
	Sungei Buloh Wetland Reserve	-.61	
Hunting beliefs	Bukit Timah Nature Reserve	-.60	.71
	Sungei Buloh Wetland Reserve	-.64	
Social affiliation beliefs	Bukit Timah Nature Reserve	1.62	.44
	Sungei Buloh Wetland Reserve	1.68	
Caring beliefs	Bukit Timah Nature Reserve	.93	.56
	Sungei Buloh Wetland Reserve	.98	

4.2.2. Bukit Timah Nature Reserve sample

4.2.2.1. Validity main concepts

Splitting the total sample size into a Bukit Timah Nature Reserve sample and a Sungei Buloh Wetland Reserve sample allows this research to compare the results of these two nature areas. In this part the results of the Bukit Timah sample will be elaborated upon first. The wildlife value orientations model predicted 13% of the variability of peoples future nature interests, which corresponds to a typical relationship or a medium effect size. It also predicted 28% of the variability of peoples conservation support, which corresponds to a substantial relationship or a large effect size. In the case of the future nature interests concept the domination variable turns out to be a better predictor than the mutualism variable, but in the case of the conservation support concept this is the other way around.

The basic beliefs model predicted 14% of the variability of peoples future nature interests, indicating a typical relationship or a medium effect size. This model also predicted 28% of the variability of peoples conservation support, indicating a substantial relationship or a large effect size. The best predictor in the case of peoples future nature interests is the hunting belief, whereas the worst one is the caring belief which is not even significant in this case. Looking at peoples conservation support it is the other way around with the caring belief as the best predictor of this concept and the hunting belief as the worst predictor, being not significant in its predictive relationship towards conservation support at all.

It can be concluded that the on basic beliefs based model is a little bit better in predicting peoples future nature interests and their conservation support than the model based on wildlife value orientations. But as already mentioned in the total sample size before, the concept of future nature interests does not prove to be really reliable, also in the Bukit Timah case, and as a result meaningful conclusions cannot be given. Something similar applies to the conservation support concept as the two parts which it contains differ in their context and approach and taken together in one concept, it might be difficult to say if they actually measure the same construct. Therefore the conclusion is once again that it might be more useful to look at the predictive validity in the cases of the four sub concepts (future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection), instead of these two main concepts.

4.2.2.2. Validity sub concepts

Continuing now with the two sub concepts future nature affiliation and future nature use, the model based on wildlife value orientations predicted 23% of the variability of peoples future nature affiliation, which can be described as a typical relationship or medium effect size. Mutualism appears to be a lot better in predicting peoples future nature affiliation than domination. Even more so, domination is not even significant in its predictions in terms of the variability of peoples future nature affiliation. This model also predicted 16% of the variability of peoples future nature use, which also indicates a typical relationship or medium effect size. In this case domination is a lot better in predicting the variabilities and is mutualism the variable that does not have significant predictive powers. When analysing the two sub concepts wildlife conservation knowledge and animal species protection with the wildlife value orientations model results in a 33% prediction of the variability of peoples wildlife conservation knowledge which corresponds to a substantial relationship or large effect size. It also results in a 10% prediction of the variability of peoples view on animal species protection, corresponding to a minimal relationship or small effect size. For both these sub concepts mutualism proved to be a lot better in predicting the variability than domination can, which is in both these cases not even significant in its predictive power.

Analysis with the basic beliefs model shows a 24% prediction of the variability of peoples future nature affiliation (substantial relationship or large effect size) and a 16% prediction of the variability of peoples future nature use (typical relationship or medium effect size). The social affiliation belief is best at predicting peoples future nature affiliation, whereas appropriate use and hunting beliefs cannot predict anything in this case as their results were very low and not significant. The hunting belief predicts best peoples' future nature use, but here there are also two basic beliefs without significant predictive power: social affiliation and caring beliefs. Looking at the other two sub concepts, this basic beliefs model predicts 33% of peoples wildlife conservation knowledge (substantial relationship or large effect size) and 12% of peoples view on animal species protection (typical relationship or medium effect size). The basic belief that predicts best people their wildlife conservation knowledge is the caring belief, whereas the social affiliation belief is in this case best in predicting people their view on animal species protection. The hunting belief is for both these sub concepts of no additional value as its predictive power of the variability is very

low and not significant. The same applies for the appropriate use belief in the case of the wildlife conservation sub concept.

In conclusion, the basic beliefs model predicted peoples future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection better than the wildlife value orientations model. The only downside, again, of splitting up the two main concepts future nature interests and conservation support into the four sub concepts, is that the significance of some of the basic beliefs and value orientations dropped or did not even reach any significance level at all. But at the opposite of this, the effect sizes were from a higher level than in the case of the two partly unreliable main concepts.

Table 12: Wildlife value orientations predicting future nature interests and conservation support of visitors of Bukit Timah Nature Reserve only

Model variable	***Future nature interests***		**Future nature affiliation**		**Future nature use**		***Conservation support***		**Wildlife conservation knowledge**		**Animal species protection**	
	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2
Wildlife value orientations		.13 ***		.23 ***		.16 ***		.28 ***		.33 ***		.10 ***
Domination	.39 ***		.02		.42 ***		-.09 *		-.08		-.08	
Mutualism	.26 ***		.50 ***		.04		.49 ***		.54 ***		.29 ***	
Basic beliefs		.14 ***		.24 ***		.16 ***		.28 ***		.33 ***		.12 ***
Appropriate use	.14 **		-.06		.19 ***		-.14 **		-.07		-.17 **	
Hunting	.33 ***		.08		.33 ***		.03		-.03		.08	
Social Affiliation	.18 **		.31 ***		.05		.27 ***		.26 ***		.19 **	
Caring	.11		.24 ***		-.00		.28 ***		.33 ***		.14 *	

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

4.2.3. Sungei Buloh Wetland Reserve sample

4.2.3.1. Validity main concepts

This part of the predictive validity section analyses the results of the Sungei Buloh Wetland Reserve sample. Here, the wildlife value orientations model predicted 9% of the variability of people their future nature interests which translates to a minimal relationship or a small effect size. This model also predicted 22% of the variability of people their conservation support which translates into a typical relationship or a medium effect size. The future nature interests of people is best predicted by the domination variable, whereas the conservation support of people is best predicted by the mutualism variable.

Looking at the model based on the basic beliefs, it can according to the data predict 9% of the variability of peoples' future nature interests, corresponding to a minimal relationship or small effect size. It can also predict 26% of the variability of peoples conservation support, corresponding to a substantial relationship or large effect size. The basic belief that best predicts the future nature interests of people is the hunting belief, but in contrast the social affiliation belief appears to be of no use here as its predictive power is very low and not significant. For the conservation support concept this is the exact opposite with the social affiliation belief as its strongest predictor of variability and hunting belief as its weakest one, not being even significant in its predictive validity.

For predicting the variability in people their future nature interests and their conservation support it can be concluded that the model based on basic beliefs is a little better than the model based on wildlife value orientations. But the same problem applies to the Sungei Buloh Wetland Reserve sample, as it did for the Bukit Timah Nature Reserve sample and

the total combined sample size, which is that the concept of future nature interests does not prove to be reliable enough resulting in rather meaningless conclusions for this concept. Also the conservation support concept struggles with something similar as the two parts of which it is build differ in what they measure and if you sum them up into one concept it might still be difficult to say if they measure the same construct or not, which might affect the reliability of the conservation support concept. So looking at the predictive validity in the perspective of the four sub concepts (future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection) is more useful than to look at the predictive validity towards the two main concepts (future nature interests and conservation support) as they do not prove to be very reliable.

4.2.3.2. Validity sub concepts

Analysing first the two sub concepts future nature affiliation and future nature use with the wildlife value orientations model results in a prediction of 16% of the variability of the future nature affiliation of people (typical relationship or medium effect size) and a prediction of 12% of the variability of the future nature use of people (typical relationship or medium effect size). Mutualism is a very good predictor of the variability of peoples' future nature affiliation, but a very bad one in terms of peoples' future nature use (not even significant). Contrary, domination proves to be a very good predictor of the variability of peoples' future nature use, but a very bad one in terms of peoples' future nature affiliation as in this case it is not significant in predicting the variability. Using the wildlife value orientations model to predict the variability of people their wildlife conservation knowledge results in a 29% prediction, indicating a substantial relationship or large effect size. It also results in a 8% prediction of the variability of people their view on animal species protection, indicating a minimal relationship or small effect size. In the case of the wildlife conservation sub concept, mutualism is a very strong predictor of the variability in contrast to the domination variable as this one is very low and not significant in predicting variability. Whereas in the case of the animal species protection sub concept, domination is the best predictor of variability with a high significance.

Analysis with the basic beliefs model illustrates a 17% prediction of the variability of people their future nature affiliation, corresponding to a typical relationship or medium effect size, and a 12% prediction of the variability of people their future nature use, corresponding also to a typical relationship or medium effect size. The social affiliation belief is best at predicting the variability of the future nature affiliation of people, whereas the hunting belief cannot predict any variability in this case as its result is very low and not significant. On the other hand, this hunting belief does predict best the variability of the future nature use of people, which the social affiliation and caring belief cannot due to a lack of significance in this case. Continuing with the other two sub concepts, the basic beliefs model predicts 30% of the variability of the wildlife conservation knowledge of people and 13% of the variability of the view of people on animal species protection. These numbers correspond to a substantial relationship or large effect size and to a typical relationship or medium effect size. The basic beliefs that best predict the variability of peoples wildlife conservation knowledge are the social affiliation belief and the caring belief, whereas the hunting belief cannot predict anything in this sub concept as it lacks significance. For the sub concept of animal species protection the appropriate use belief can be seen as the best predictor of its variability, while the hunting and caring beliefs are of no use here as they have no significant predicative validity at all in this specific case.

Concluding everything mentioned before, the basic beliefs model predicted the future nature affiliation, future nature use, wildlife conservation knowledge and animal species protection of people better than the wildlife value orientations model did. But here too, just as in the samples before also became apparent, splitting up the two main concepts of future nature interests and conservation support into these four sub concepts resulted in

a drop in significance numbers of some of the variables of the wildlife value orientations model and basic beliefs model. This happened to the point that some of these variables were not even significant at all anymore. Although in its turn, effect sizes were in general higher for the four sub concepts than for the two main concepts and it must not be forgotten that the four sub concepts are reliable enough to be able to properly use the results as conclusions whereas the reliability of the two main concepts can be seen as too low and therefore results of these concepts might be unsuited to use as proper conclusions.

Table 13: Wildlife value orientations predicting future nature interests and conservation support of visitors of Sungei Buloh Wetland Reserve only

Model variable	***Future nature interests***		**Future nature affiliation**		**Future nature use**		***Conservation support***		**Wildlife conservation knowledge**		**Animal species protection**	
	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2	β	A. R^2
Wildlife value orientations		.09 ***		.16 ***		.12 ***		.22 ***		.29 ***		.08 ***
Domination	.33 ***		-.04		.36 ***		-.14 **		-.04		-.20 ***	
Mutualism	.20 ***		.38 ***		.03		.39 ***		.52 ***		.16 **	
Basic beliefs		.09 ***		.17 ***		.12 ***		.26 ***		.30 ***		.13 ***
Appropriate use	.12 *		-.13 **		.19 ***		-.25 ***		-.12 *		-.30 ***	
Hunting	.28 ***		.08		.26 ***		.07		.06		.05	
Social Affiliation	.08		.22 ***		-.02		.27 ***		.29 ***		.16 **	
Caring	.14 *		.20 **		.05		.16 **		.29 ***		.00	

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

4.3. Sample comparison

4.3.1. Predictive validity main concepts

Comparing the two sub samples with each other makes clear that in general the visitors of the Bukit Timah Nature Reserve have a stronger and more coherent relationship between their wildlife value orientations or basic beliefs and their future nature interests and conservation support than the visitors of the Sungei Buloh Wetland Reserve have. Or, to put it in the words of Cohen (1988), the effect sizes in the Bukit Timah Nature Reserve sample are bigger than in the Sungei Buloh Wetland Reserve sample. Comparison between these two sub samples shows that the Bukit Timah sample has in most instances a higher predictive validity, but there are more differences that can be mentioned. Starting with the differences in predictive validity of the basic beliefs on people their future nature interests, as mentionable differences in significance and effect size occur in the appropriate use, social affiliation and caring beliefs. For instance the appropriate use belief is less significant and of a lower predictive usage in the Sungei Buloh sample than in the Bukit Timah sample and the social affiliation sample is not significant at all in the Sungei Buloh sample (with no predictive usage at all), whereas it has a significance level of $p<0.01$ in the Bukit Timah sample and higher predictivity. In terms of the caring belief it is the other way around as it has no significance in the Bukit Timah sample, hence no predictive value, while it is significant in the Sungei Buloh sample with predictive value.

Continuing with the differences in predictive validity of the wildlife value orientations on people their conservation support, the main difference between the Bukit Timah and Sungei Buloh sample is the predictive validity of the variable of domination. In the Sungei Buloh case this variable is a better predictor, with a higher significance level, of the variability of the conservation support of people than in the Bukit Timah case. When using the basic beliefs model in predicting this concept some more differences appear of which the ones

in the appropriate use belief and the caring belief are the most interesting. The appropriate use belief is in the sample of Sungei Buloh a better (and more significant) predictor of the variability of peoples conservation support than in the Bukit Timah sample. But for the caring belief this is the other way around as this variable has a higher predictive validity (and is more significant) in the Bukit Timah case than in the Sungei Buloh case.

Based on the wildlife value orientations model and the basic beliefs model, the Bukit Timah Nature Reserve sample is a better predictor of the variability of the two main concepts (future nature interests and conservation support) than the Sungei Buloh Wetland Reserve sample. However, as it is questionable if these two concepts are reliable, this sub-chapter will further focus on the four sub concepts.

4.3.2. Predictive validity sub concepts

Starting with the sub concept future nature affiliation two mentionable differences appear between the Bukit Timah sample and the Sungei Buloh sample. The first one is the difference in the predictivity of the appropriate use belief. In the case of the Bukit Timah sample it has no predicative value of the variability of people their future nature affiliation as it is not significant, whereas in the Sungei Buloh sample its predictive validity is higher and significant at a $p<0.01$ level. The second one is the difference in the predictivity of the caring belief as it is higher and more significant in the Bukit Timah sample than in the Sungei Buloh sample in predicting the variability of the future nature affiliation of the visitors. For the sub concept future nature use there are no big differences between the two sub samples indicating that the predicative validity is almost the same for the two nature area samples.

Looking at the sub concepts of conservation support, again in the basic beliefs model there are some differences between the Bukit Timah sample and the Sungei Buloh sample worthwhile mentioning. The first one is in the sub concept wildlife conservation knowledge where the appropriate use belief is of no predictive value (not significant) in the Bukit Timah case, whereas it is significant and with a higher predicative validity in the Sungei Buloh case. In terms of the animal species protection sub concept there are more differences between the two samples and not only in the basic beliefs model but also in the wildlife value orientations model. The biggest difference in the wildlife value orientations model is the predicative validity of the domination variable. In the Bukit Timah case it has no predictive validity whatsoever as it is not even significant, while in the Sungei Buloh case this variable is significant at a $p<0.001$ level with a high predictive validity on people their view on animal species protection. For the mutualism variable it is the other way around but the difference is of a lesser magnitude. In the Bukit Timah sample it has a higher and more significant predictive power of the variability of the view on animal species protection than this variable has in the Sungei Buloh case. It looks like in the Bukit Timah case people their view on animal species protection can only be predicted based on their mutualism orientation whereas in the Sungei Buloh case this sub concept can be predicated by the domination variable and mutualism variable both, although in a lesser extent.

Continuing with the basic beliefs model on this sub concept, the differences of the appropriate use and caring belief between the two nature area cases are worthwhile mentioning. The appropriate use belief is a lot better in predicting the variability of the view of people on animal species protection in the Sungei Buloh case than in the Bukit Timah case. Its predictive validity is almost twice as high in the Sungei Buloh case and also more significant than it is in the Bukit Timah case. For the caring belief it is the other way around as its predictive value towards peoples' view on animal species protection is a lot higher and significant in the Bukit Timah case, but of no use at all as a predictive variable in the Sungei Buloh case.

4.4. Predictive Validity of Conservation Support Attitudes

4.4.1. Validity of prediction

Up till now this study only looked at wildlife value orientations and basic beliefs as predictors of conservation support attitudes and future nature interests and intentions. But as an extra dimension in this research, it is also interesting to look at the predictive validity of conservation support attitudes towards future nature interests, without the involvement of wildlife value orientations and basic beliefs. From this perspective, wildlife conservation knowledge and animal species protection attitudes are deemed the independent variables and future nature affiliation and future nature use intentions the dependent variables as they are higher up in the cognitive hierarchy. This results in the following outcomes in terms of prediction of the variability of the dependent variable: conservation support as an overall independent variable can predict only 4% (minimal relationship or small effect size) of the overall dependent variable of future nature interests. However, when the dependent variable is split up into future nature affiliation and future nature use, the prediction of the variability changes a lot between the two sub concepts. In this case future nature affiliation can be predicted in its variability for 42% by the conservation support concept (substantial relationship or large effect size). But the future nature use sub concept does not differ at all from the future nature interests concept in terms of predictability of its variability and is also 4% (minimal relationship or small effect size). The sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge, but also the animal species protection sub concept has relatively good predictive power towards future nature interests of people. The same applies for the sub concept future nature affiliation where wildlife conservation knowledge is also best in predicting and the animal species sub concept here too is relatively strong in predicting this. For the future nature use concept the situation is different, the best predictor is the animal species protection sub concept whereas the wildlife conservation knowledge sub concept has no predictive power as it is not significant in combination with a low value.

Table 14: Conservation support predicting future nature interests of visitors of Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve

Model variable	*Future nature interests (intentions)*		Future nature affiliation		Future nature use	
	β	A. R^2	β	A. R^2	β	A. R^2
Conservation support (attitudes)		.04 ***		.42 ***		.04 ***
Wildlife conservation knowledge	.22 ***		.58 ***		-.05	
Animal species protection	-.11 **		.13 ***		-.19 ***	

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

Again, as the dataset is big enough for location comparison between Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve, it must be checked if these two areas are also comparable in terms of people their conservation support attitudes. The table below shows the means of the wildlife conservation knowledge attitude of people and the animal species protection attitude of people and the significance levels of them between the two nature areas. It can be concluded that the areas are comparable in terms of visitors and their conservation support attitudes (see table 15), making it possible to study the nature reserves apart from each other and compare them afterwards to see if there are any significant differences between the two.

Table 15: Means of the Conservation Support attitudes per nature reserve

Model independent variable	Location	Mean	Significance
Wildlife conservation knowledge	Bukit Timah Nature Reserve	1,29	.29
	Sungei Buloh Wetland Reserve	1.36	
Animal species protection	Bukit Timah Nature Reserve	1,70	.08
	Sungei Buloh Wetland Reserve	1.82	

4.4.2. Nature reserve subsamples and comparison

In the Bukit Timah Nature Reserve case, the conservation support independent variable can predict only 6% of the variability of people their future nature interests. This corresponds with a minimal relationship or small effect size. When this dependent variable is split up into future nature affiliation and future nature use the predictive power of the conservation support concept towards the variability of the sub concepts differs. 42% of the variability of the future nature affiliation intentions of people can be predicted by their conservation support attitude, this can be described as a substantial relationship or large effect size. However, the future nature use sub concept is nothing like this, only 5% of the variability of this sub concept can be predicted by the conservation support concept which means a minimal relationship or small effect size between the two. Again, just like in the overall case, the sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge. But also the animal species protection sub concept has relatively good predictive power towards future nature interests of people. This applies even more so for the future nature affiliation sub concept where wildlife conservation knowledge is also best in predicting, whereas the animal species sub concept here is relatively a lot weaker in predicting this but still significant. For the future nature use concept the situation is again different. Here the best predictor is the animal species protection sub concept whereas the wildlife conservation knowledge sub concept has no predictive power at all as it has a very low predictive value in combination with no significance.

Table 16: Conservation support predicting future nature interests of visitors of Bukit Timah Nature Reserve

Model variable	*Future nature interests*		Future nature affiliation		Future nature use	
	β	A. R^2	β	A. R^2	β	A. R^2
Conservation support		.06 ***		.42 ***		.05 ***
Wildlife conservation knowledge	.25 ***		.61 ***		-.02	
Animal species protection	-.16 **		.09 *		-.22 ***	

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

In the case of the Sungei Buloh Wetland Reserve, the independent variable of conservation support can predict no more than 3% of the variability of peoples' future nature interests. This means that the relationship is minimal between the two or the effect size is small. But, just like in the Bukit Timah case, when the dependent variable is split up into future nature affiliation and future nature use the predictive power of the conservation support concept towards the variability of the sub concepts is different. 41% of the variability of

the future nature affiliation intentions of people can be predicted by their conservation support attitude, or in other words, this is a substantial relationship or large effect size. In contrast, the future nature use sub concept is nothing like this, only 3% of the variability of this sub concept can be predicted by the conservation support concept which translates into a minimal relationship or small effect size. Here too, just as in the Bukit Timah case, the sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge. But in this case the animal species protection sub concept is of no value at all in predicting the variability of people their future nature interests. For the future nature affiliation sub concept the best predictor of its variability is also wildlife conservation knowledge followed by the animal species sub concept which still is a good predictor as well. Again, for the future nature use concept the situation is different. Here the best predictor is the animal species protection sub concept and in contrast the wildlife conservation knowledge sub concept has no predictive power at all due to not being significant combined with a low predictive value.

Table 17: Conservation support predicting future nature interests of visitors of Sungei Buloh Wetland Reserve

Model variable	*Future nature interests*		Future nature affiliation		Future nature use	
	β	A. R^2	β	A. R^2	β	A. R^2
Conservation support		.03 **		.41 ***		.03 **
Wildlife conservation knowledge	.18 **		.55 ***		-.07	
Animal species protection	-.06		.18 ***		-.14 **	

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

Looking at the differences between the Bukit Timah Nature Reserve sample and the Sungei Buloh Wetland Reserve sample, a few things stand out. To start, there is a big difference in the predictive power of the animal species sub concept towards the variability of the future nature interests concept as a whole. In the case of the Bukit Timah sample there is a predictive relationship between the two with a high level of significance whereas in the Sungei Buloh sample there is not. Another big difference also has to do with the animal species sub concept, this time in its predictive power towards future nature affiliation intentions of visitors. In the Bukit Timah case there is not a really strong predictive relationship between these two sub concepts while in the Sungei Buloh case there is a pretty strong predictive relationship between the two. Overall, it seems like the animal species sub concept is in these cases the opposite in its predictive power. Why this is the case is hard to explain, but it could have something to do with the fact that the differences in means are almost significant, especially compared to the differences in means between the wildlife conservation knowledge sub concept for the two cases. It also becomes clear that overall the significance levels in predictability are higher for the Bukit Timah case than for the Sungei Buloh case. It seems that the Bukit Timah case has a stronger internal correlation between the concepts than the Sungei Buloh case, but why this is cannot be explained that easily and further research might be needed to come with a satisfactory answer.

5. Discussion

This research showed the relations that exist between people their wildlife value orientations, their wildlife conservation support attitudes and their anticipated future behavioral intentions regarding wildlife. Although overall strong connections seem to be apparent, certain points need to be taken into account before proper conclusions can be made. As this was a first time study in connecting these three concepts in such a way to see if they can be related to one another, some complications and other points of interest that need attention are being addressed in this chapter.

5.1. Interpretation of results

Before giving definitive conclusions on the results of this research, although the results show that the three concepts are related quite strongly to each other, it is necessary to elaborate on how the results should be interpreted. To start, it is worth noting that previous research argues that economic development is associated with trends away from fixed and static norms/values toward norms/values which are more participatory, trusting, tolerant and rational (Inglehart & Baker, 2000). Data supports that economic development (higher income, better education, more urbanization) can be linked to a population-level shift from domination to mutualism value orientations. Such a shift could stimulate institutional, ecological and behavioral effects that are critical in shaping human-wildlife interactions (Manfredo, Teel & Henry, 2009). However, changes in norms and values depend mostly on the cultural heritage in which they are embedded and in economically developed modern society this is dominated by Western influences that leave marks on norms and values that endure despite modernization. Differences between the norms and values held by people of different cultures within given societies like in Singapore are therefore much smaller than cross-national differences and once established, such cultural norms and values become part of a national culture transmitted by educational institutions and media (Inglehart & Baker, 2000).

Going a little deeper into interpreting the results, the first point of attention is the hunting belief item. Following the example of research of Zainal and Jacobs (2016), an inspection of the correlation matrix of the underlying statements of the hunting belief was performed. Outcomes showed that although the correlation between the statements "Hunting is cruel and inhumane to the animals" and "Hunting does not respect the lives of animals" was .87, while the correlation between the statements "We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so" was .33, all other correlations across the four hunting statements were relatively low (in between .12 to .26). On top of this two dimensions with Eigenvalues higher than 1, grouped together in the same way as in the correlation matrix described, were revealed by an exploratory factor analysis with Varimax rotation over the four hunting belief statements. This, together with explained variances of 52% and 29% in these two dimensions, suggested that the hunting statements might reflect a two dimensional construct in this Singaporean case study. The first construct related to the consequences of hunting for wildlife (involving the statements "Hunting is cruel and inhumane to the animals" and "Hunting does not respect the lives of animals"), whereas the second construct related to hunting opportunities for humans (involving the statements "We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so"). This was also the case in wildlife value orientations research in Malaysia, the hunting beliefs scale did not reflect basic thinking about wildlife and data suggested two different hunting dimensions: human opportunities for hunting and consequences of hunting for wildlife (Zainal Abidin, & Jacobs, 2016). So it is important to be aware of the fact that the hunting belief statements do not fully cover a homogenous item of hunting in some cases. A possible explanation for this could be given with the theory of planned

behavior, a theory which found that not perceptions of behavioral control but hunting intentions contribute most to the prediction of self-reported hunting intentions. These hunting beliefs are strongly influenced by subjective norms, attitudes and perceptions of behavioral control. However, broad values relating to wildlife correlate weakly with hunting behavior according to this theory (Hrubes, Ajzen & Daigle, 2001).

The same applies to the future nature interests concept, as inspection with a correlation matrix of the underlying statements resulted in a correlation between the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future" of .49 and correlations between the other four statements of this concept were all between .48 and .71, whereas all other correlations between the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future" and the other four statements of the future nature interest concept were a lot lower, between -.18 and .05. On top of that, exploratory factor analysis with Varimax rotation over the six future nature interests statements revealed the same two dimensions with Eigenvalues higher than 1, as already illustrated by the correlation matrix. This in combination with explained variances of 46% and 25% of the two dimensions suggests that the future nature interests concept statements might reflect a two dimensional construct in this Singaporean case. The first construct relates to future nature affiliation based interests (involving statements "I am interested to go watching wildlife in their natural habitat in the future", "I am interested to visit nature areas in the future", "I am interested to help protect nature and wildlife in the future" and "I am interested to learn more about nature and wildlife in the future"), whereas the second construct relates to future nature usage based interests (involving the statements "I am interested to go fishing in the future" and "I am interested to go hunting/trapping in the future"). In this case the overall concept of future nature interests did not prove to be reliable, so usage of the two sub-concepts future nature affiliation and future nature use were given priority as those two did prove to be reliable. Maybe those differences in reliability are a result of different broad cultural ideals that form the basis for more specifically different cognitions which in turn drive future individual action. This could translate into people's different relationships with wildlife based on different cognitive foundations shaping their future human behaviour toward wildlife (Teel et al, 2010).

What also needs to be addressed for the interpretation of the results is the fact that measuring people visiting a nature area, although purposely chosen as a research area in this case, might lead to biased results if the outcomes are used to extrapolate it to a wider public. There are many different values that individuals associate with nature and wildlife and these are subjective to local context and the multiple ways in which individuals define wildlife and nature values. Therefore assuming that there are constant wildlife value orientations that do not change within a country's population is a mistake (Hunter & Brehm, 2004). In other words, the group of people studied in this research might not reflect the general public of Singapore which is more likely to visit nature areas less often and therefore might think differently about nature and wildlife, which might result in different outcomes in terms of reliability and predictive validity of the concepts and methods used in this research. This point of attention is however only applicable when these case-specific results of this study are used as outcomes of Singapore as a whole. For now, the results only say something about people spending leisure time in nature areas, both locals and foreigners in Singapore.

Another point of attention when interpreting the results, although the wildlife value orientations concept by itself has been researched extensively and tested often, is the combination of the three main concepts in terms of predictive validity. The future nature interests concept and the conservation support concept are not yet studied on a same in-depth level as the wildlife value orientations concept and the two are built up from multiple

different researches and questionnaires (Hrubes, Ajzen and Daigle, 2001; Tarrant, Bright and Cordell, 1997; Ballantyne, Packer and Falk, 2011; Zainal and Jacobs, 2016; Jacobs et al, 2014; Jacobs et al, 2012). The future nature interests concept is derived from a combination of work of Hrubes, Ajzen and Daigle (2001) and Tarrant, Bright and Cordell (1997), but did prove to have as an overall concept some reliability difficulties as mentioned before. The conservation support concept is based on work of Ballantyne, Packer and Falk (2011), Zainal and Jacobs (2016), Jacobs et al (2014) and Jacobs et al (2012). However, for this concept it needs to be taken into account that low knowledge about wildlife conservation does not automatically have to result in unfavorable attitudes regarding wildlife conservation. The existence of wildlife conservation knowledge can better be seen as an external moderating variable in the cognitive hierarchy framework in which general attitudes mediate the relationship between values and specific attitudes (Tarrant, Bright & Cordell, 1997). By putting together different literature, questionnaires and studies to form these two concepts and make them measurable and analyzable, as this research tried to do, could have resulted in mainly negative consequences of the reliability and predictive validity of the concepts. However, statistical research with SPSS has proven that both newly constructed concepts and the way to measure them are, in the case of this research, to a certain extend reliable enough and valid in most of their predictive abilities. The question is if the combination of concepts as introduced in this study also prove to be reliable and predicative valid towards each other in different cases involving people less focused on nature based leisure.

While interpreting the results it also must be taken into consideration that the timing of collecting data is of influence on the results. The results might have been different if the research was done during another time of the year. In this study, most of the data was collected during the months of December and January, because peak season in Singapore runs from December till May, in which especially between half of December till half of February a lot of tourists visit Singapore for Christmas, New Year and Chinese Lunar New Year and most of the local people have holidays around that time (www.frommers.com). Collecting data during these couple of months was therefore on purpose, because chances where higher that Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve have more visitors during these months and therefore more respondents would take the questionnaire which resulted in a higher response rate and more data to make quantitative analyses stronger and better applicable. Taking into account that the research was done in two of the most busy months of the year for Singapore is therefore important as the results might not reflect accurately the year round situation in Singapore in terms of visit frequency and the demographic background of the visitors of these two nature areas.

It must also not be forgotten that Bukit Timah and Sungei Buloh differ between each other in terms of nature, accessibility and visitors' demographics. Bukit Timah Nature Reserve is 163 hectares and situated in the middle of Singapore, which makes it easily accessible. It includes Singapore's highest hill and retains one of the few areas of primary rainforest in the country (www.nparks.gov.sg). In contrast, Sungei Buloh Wetland Reserve is situated at the most northern part of the coastline of Singapore and is a little harder to access. It includes 202 hectares of mangroves, mudflats, ponds and forests, providing an even larger sanctuary for its flora and fauna than Bukit Timah does (www.nparks.gov.sg). Also the significant differences in demographics of the visitors (see the results chapter part 3.3.) might have led to differences in results between Bukit Timah and Sungei Buloh. The demographics were however not the focus of this study and besides hard to study as these significant differences in demographics made it difficult to compare the exact influence of most demographic attributes on the results of the wildlife value orientations between the visitors of the two parks.

Lastly, throughout the methods and results chapters it became apparent that there are differences in the domination and mutualism scale versus the four basic beliefs scale of the wildlife value orientations concept in terms of their reliability and predictive validity towards the other two concepts. There is a dichotomy in the two scales that measure people their wildlife value orientations: on average the domination/mutualism scale has a higher reliability and the basic beliefs scale has a higher predictive validity on average. Or in other words, when using the domination/mutualism scale to predict people their future nature interests and their conservation support there is a higher reliability but a lower validity. Whereas while using the basic beliefs scale to predict people their future nature interests and their conservation support there is a higher validity but a lower reliability. Both scales have their pros and cons and can be used in combination to predict people their future nature interests and wildlife conservation support.

5.2. Strengths and limitations

This research, like any study, has its strengths and limitations. The most important ones are elaborated upon in this section. Starting with a strength of research toward nature and wildlife based leisure, is its potential to positively impact peoples' appreciation, actions and awareness toward wildlife and nature (Ballantyne, Packer, & Falk, 2011). Not only in this Singapore based research but also for instance in research in Colorado, it is suggested that values of actors and stakeholders entail important information for an integrative approach to wildlife planning (Bright, Manfredo & Fulton, 2000). Knowledge about wildlife value orientations can therefore help wildlife management to understand the diversity of value orientations that exist, understand opposition or support for certain management policies, estimate the demand for wildlife-related activities and educate people about recreation opportunities and wildlife policy (Bright, Manfredo & Fulton, 2000). At the end, all of this can help in identifying, selecting and evaluating those policy alternatives that achieve the desired wildlife management goals without compromising the experience of people and wildlife (Bright, Manfredo & Fulton, 2000). Although this strength is an often used argument to look into wildlife value orientations based research, the practical and scientific usefulness of the wildlife value orientation concept depends mostly on its predictive potential (Vaske & Sijtsma, 2014).

A limitation, as mentioned in the interpretation section, is the fact that there were problems with the hunting belief sub concept during this research. Although according to Fulton, Manfredo and Lipscomb (1996) results of reliability analysis and confirmatory factor analysis indicate that an internally consistent and reliable measurement instrument for the evaluation of wildlife value orientations and basic wildlife beliefs was developed that should be able to predict attitudes and therefore partly the behavioral intentions of people (Fulton, Manfredo, & Lipscomb, 1996), in this study the inter item-total correlations of two of the four statements of the hunting beliefs sub concept proved to be unreliable and is therefore a sub concept that needs extra attention. Especially as this sub concept has proven its reliability before in other cases in different parts of the world (Jacobs et al, 2014; Vaske, Jacobs and Sijtsma, 2011; Teel and Manfredo, 2009; Manfredo et al., 2009; Hermann, Voss, and Menzel, 2013; Gamborg & Jensen, 2016). As the Cronbach's alpha values and the inter item-total correlation values of the hunting beliefs statements in this research were relatively low compared to the other belief sub concepts, it can be concluded that this is a weak spot in the basic-beliefs approach of the wildlife value orientations concept in this Singaporean case. But not only in Singapore this happened, similar results also came forward in wildlife orientations research done in Malaysia (Zainal and Jacobs, 2016). It seems that the hunting beliefs sub concept as a whole is not everywhere in the world applicable and shows to be a limiting factor of the basic-beliefs scale.

Another limitation in this research that needs attention is the concept of future nature interests (as mentioned in the section before). Analyzing the reliability of this concept, it

became clear that it did not meet Cronbach's alpha cut-off point of .65 in any of the three cases (Bukit Timah case, Sungei Buloh case and overall case) and seemed not to be reliable as a concept to measure people their future wildlife and nature based interests. Concluding that in its current form this concept is not reliable enough as an overarching concept to test people their anticipated future behavioral intentions regarding wildlife. Only when the concept got split into two sub concepts the reliability increased, but this meant that the newly formed future nature use sub concept only consisted out of two statements (items) and that is generally not seen as a strong reliable measurement tool (Vaske, 2008). The creation of these two sub concepts of future nature interests resulted in higher Cronbach's alphas exceeding the cut-off point in all three cases for future nature affiliation and do as well in the overall nature area case and Sungei Buloh case regarding the future nature use sub concept. However, to make the future nature use sub concept more reliable it needs at least four statements/items (Vaske, 2008), like the future nature affiliation sub concept has which did prove to be more reliable.

Strengths and limitations did also come with the selection of the nature areas Bukit Timah and Sungei Buloh as case study areas, because they are fairly different in terms of nature, accessibility and kind of visitors (www.nparks.gov.sg). The upside of this selection is the fact that it does give a more complete and comprehensive picture of the type of nature area visitors in Singapore in general, which makes the results as a whole Singaporean case more salient and a better representation of the nature area visitors of Singapore. The downside is that the outcomes between the two nature reserves are a little more difficult to compare in terms of the demographics of the visitors. The usage of demographics as sets of predictors to examine people their future nature interests and conservation support were not enough explored in this study. This is partly because previous research in both Denmark and Germany on the relation of age, gender, past and present residence, education and income on people their wildlife value orientations resulted in the conclusion that only gender and education have a pronounced effect on just the mutualism wildlife value orientation and its accompanied basic beliefs (Gamborg & Jensen, 2016; Hermann, Voss & Menzel, 2013). As well as because research done by Sijtsma, Vaske & Jacobs (2012) in the Netherlands on the usage of wildlife value orientations (domination and mutualism) and demographics (age, gender, education and current residence) as sets of predictors to examine the use of lethal control of wildlife also resulted in the fact that only the value orientations were statistically significant predictors, the demographics proved not to be statistically significant predictors in this research (Sijtsma, Vaske & Jacobs, 2012). These outcomes of previous studies together with the fact that this research's main focus was to investigate the predictive relations between people their wildlife value orientations and their future nature interests and conservation support, resulted in the decision to limit study of the connections between demographic background and wildlife value orientations.

However, in other research done in the Netherlands trying to link differences of wildlife value orientations and demographic characteristics, showed that domination oriented people are more likely to be older, living in the countryside and man, whereas mutualism oriented individuals are more likely to be younger, living in an urban area and female (Vaske, Jacobs & Sijtsma, 2011). This suggest that wildlife value orientations could be related to the demographic background of people. Therefore in this Singaporean case it was opted to compare the Bukit Timah area with the Sungei Buloh area, because analysis showed some major differences in people their demographic indicators between the two areas. However, this investigation was limited by the fact that the visitors of the two nature areas were only significantly comparable in terms of their religious affiliation and their monthly income in US dollars, for the other demographics age, gender, home country and educational level there were significant differences between the visitors of the two nature areas. This made comparing the influence of the demographic background of the visitors of the two parks difficult as not all demographic indicators were significantly comparable.

5.3. Recommendations

To finish the discussion chapter recommendations will be given for further research. The first recommendation of this study is to call for a revision of the hunting beliefs sub concept in such a way that all four statements measure the same construct everywhere in the world. Because in its current form, the hunting beliefs (statements) seem to be approached differently by societies from countries with a European/American culture and countries who have a different culture (Zainal Abidin, & Jacobs, 2016). By revising the statements of the hunting belief item to measure the same hunting construct everywhere in the world, it will make the results of different studies taken place in different parts of the world better comparable and more useful in terms of wildlife value orientation research. How to change these four statements is up for debate and needs testing to see if they will eventually measure the same construct (Zainal Abidin, & Jacobs, 2016). Research solely targeting to study the hunting belief item within the domination item is therefore advised to check whether different cultures have different views and beliefs towards hunting. Future cross-cultural comparisons of wildlife value orientations and modifications of the scales to better reflect salient beliefs in non-Western nations are recommended (Zainal Abidin, & Jacobs, 2016). Also, reconsideration of the cross-cultural usage and applicability of the quantitative scales of the wildlife value orientations concept in combination with the concepts of future nature interest and conservation support might be useful. The basic beliefs scale showed to have stronger individual connections to the future nature interests concept and the conservation support concept in terms of predictive validity, although not always in terms of reliability, than the domination/mutualism scale. This is probably due to outcomes being slightly differently calculated between both scales, but worth investigating further.

Secondly, this study recommends that it might be a good next step for further research to look into the general public of a very urbanized country like Singapore and their associated wildlife value orientations. It was not the aim of this research to target the general public of Singapore, but the part of Singaporean residents and tourists that spend leisure time in nature areas. However, as people are influenced by space (nature) and time (holidays) in their perceptions of the experience to satisfy their expectations and needs (Falk, Ballantyne, Packer, & Benckendorff, 2012), it might be a logical follow-up step to study the general public of a very urbanized country outside of nature areas. This might result in different outcomes as research suggests that people living in an urban area tend to be more mutualism oriented (Vaske, Jacobs & Sijtsma, 2011) and will further test the reliability and predictive validity of the concepts and methods used in this research based on nature area visitors. Further research can tell if the methods and concepts used in this research are to be universally sound and if they are able to get used in different cases all over the world. Not only in terms of people their wildlife value orientations like for instance in the Netherlands, the United States of America, Germany and Denmark (Jacobs et al, 2014; Vaske, Jacobs and Sijtsma, 2011; Teel and Manfredo, 2009; Manfredo et al., 2009; Hermann, Voss, and Menzel, 2013; Gamborg & Jensen, 2016), but in combination with the future nature interests concept and the conservation support concept as introduced in this study. Also is it advisable for further research in Singapore to change the timing of collecting data the next time in order to get a more complete picture of the year-round situation of Singapore and its visitors. In other words, comparison with a duplicate research based on another time outside of peak season for data collection might be useful, also to see if there are any differences between the two time periods.

Also is further research recommended to figure out the exact influence of the demographics of people on their wildlife value orientations, in this case between the two nature areas Bukit Timah and Sungei Buloh, but also in gerenal. For instance in research done in Ohio, males and females appeared to have significant differences in their wildlife value orientations and the results indicated that it is important to focus on understanding these

differences between males and females (Dougherty, Fulton & Anderson, 2003). Also tried research in the Netherlands to link differences in wildlife value orientations to four demographic characteristics: age, gender, current residence and education. People with a domination wildlife value orientation turned out to be statistically older than mutualism oriented individuals and females tend to be more mutualism oriented (Vaske, Jacobs & Sijtsma, 2011). This information about public demographic characteristics and wildlife value orientations can therefore help wildlife managers to support or oppose to management policies and better understand the diversity of wildlife value orientations that exist among people.

Concluding, in order to prove the outcomes of this study were not just a single case specific situation, further research in this study area is recommended to demonstrate the reliability and predictive validity of the two concepts (future nature interests and conservation support) and their accompanying questionnaire questions in relation to the wildlife value orientations concept.

6. Conclusion

6.1. Methods and reliability

This research had as objective to better understand nature and wildlife based leisure and recreation in a metropolitan area like Singapore. It did so by researching people visiting the Bukit Timah Nature Reserve and the Sungei Buloh Wetland Reserve in Singapore investigating the relations between visitors' wildlife value orientations, their anticipated future wildlife based intentions and their wildlife conservation support attitudes and knowledge. This research objective was accompanied by three research questions:

1) What is the relation between the wildlife value orientations of people visiting the Bukit Timah Nature Reserve and the Sungei Buloh Wetland Reserve and their anticipated future behavioral intentions regarding wildlife and nature?
2) What is the relation between the wildlife value orientations of people visiting the Bukit Timah Nature Reserve and the Sungei Buloh Wetland Reserve and their conservation support attitudes and knowledge of wildlife?
3) What is the relation between the wildlife conservation support attitudes and knowledge of people visiting the Bukit Timah Nature Reserve and the Sungei Buloh Wetland Reserve and their anticipated future behavioral intentions regarding wildlife and nature?

In this concluding chapter each of these three research questions will be elaborated upon. However, before this is done the reliability of the mentioned concepts were checked to see if they measure the constructs the questionnaire was designed to measure. Nineteen items were used to assess the wildlife value orientations of domination and mutualism. Domination consisted of 6 appropriate use belief items and 4 hunting belief items, whereas mutualism consisted of 4 social affiliation belief items and 5 caring belief items. To assess the future wildlife based interests (6 items) and conservation support (23 items) of people visiting Singaporean nature areas, responses to 4 future nature affiliation items and 2 future nature use items as well as to 8 wildlife conservation knowledge items and 15 animal species protection items were used (29 statements in total).

On the basis of analysis done in the methods chapter is it hard to say (as shown in table 7 in that chapter) what the exact relation is between background demographics (and culture) of people and their wildlife value orientations and basic wildlife beliefs. In some cases it is evident that these demographics did have significant influence on the wildlife value orientations and basic beliefs of people, for instance whether the respondents are from foreign countries (most of them are tourists visiting Singapore) or if they are from Singapore (local) or whether they have a high level of education or a low level. But more research and a better representative dataset for the different countries and religions in the world is needed to be able to research better the relations between background demographics and wildlife value orientations. However, the dataset was big enough for location comparison between Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve, but it needed to be checked if these two areas are also comparable in terms of visitors their demographic background. The results of that analysis show that the two areas are only comparable in terms of visitors' religious affiliation and their monthly income in US dollars as there is no significant difference of these two indicators between the visitors of Bukit Timah and Sungei Buloh. But for the indicators age, gender, home country (foreign or local) and educational level there are significant differences between the visitors of the two nature areas. This makes comparing the demographic impact on the wildlife value orientations of visitors of the two parks only useful between the first two mentioned indicators. And analysis showed that big differences appear between the two seemingly comparable cases. However, further research needs to be done to investigate the exact influence of these demographics on people their wildlife value orientations in order to make it possible to come with answers as to why these two nature areas differ so much in terms

of the influence of visitors' religious affiliation and their monthly income in US dollars on their wildlife value orientations.

Next to the influence of demographics, reliability analyses ('Inter-item total correlation', 'Alpha if item deleted' and 'Cronbach's alpha') following the example of research of Zainal and Jacobs (2016) in Malaysia, were used to check to what extent the statements of the wildlife value orientations and underlying basic beliefs measure the same constructs. These analyses were also used to check to what extent the items of future nature based interests and conservation support and their basic underlying thoughts measure the same constructs as well. To estimate the predictive validity of peoples' wildlife value orientations in the assessment of their future nature based interests and conservation support, two regression models were used. The first model used domination and mutualism as predictors and the second model used the four basic beliefs of appropriate use, hunting, social affiliation and caring as predictors (Zainal and Jacobs, 2016). The same analyses were conducted for the Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve samples separately. For the total sample size, as well as for the Bukit Timah sample size and the Sungei Buloh sample size it can be concluded that the Wildlife Value Orientations concept is reliable enough to do research with. Furthermore, the internal consistencies of the mutualism scale and its associated basic beliefs of social affiliation and caring were in all three samples higher than the internal consistencies of the domination scale and its associated beliefs of appropriate use and hunting, making them more reliable. However, the Conservation Support concept proved to be reliable enough to do research with in all three cases but consisted of too many items and the Future Nature Interests concept did not prove to be very reliable at all. So out of these two main concepts, four sub-concepts were developed resulting in high internal consistencies of the Conservation Support associated sub concepts of Wildlife Conservation Knowledge and Animal Species Protection and high internal consistencies of the Future Nature Interests associated sub concepts of Future Nature Affiliation and Future Nature Use, making these sub-concepts a lot more reliable. Having made clear that the (sub-)concepts are reliable enough, the research continued with the analysis of the predictive validity of the three main concepts and their associated sub-concepts in order to be able to answer the research questions.

6.2. Results and predictive validity

6.2.1. Predictive relation of wildlife value orientations towards future nature behavior

In the total sample size, the wildlife value orientations model, based on domination and mutualism as independent variables, predicted 12% of the variability of peoples future nature interests (typical relationship or medium effect size). In the case of peoples future nature interests the domination variable proved to be a better predictor than the mutualism variable. The basic beliefs model, based on appropriate use, hunting, social affiliation and caring beliefs as independent variables, predicted also 12% of the variability of peoples' future nature interests (typical relationship or medium effect size). The hunting belief proved to be the best predictor in the case of peoples future nature interests. Looking at the two sub concepts of future nature interests, the wildlife value orientations model predicted 20% of the variability of peoples future nature affiliation (typical relationship or medium effect size) and 14% of the variability of peoples future nature use (typical relationship or medium effect size). Mutualism is a lot better in predicting peoples future nature affiliation than domination is, whereas domination in its turn is a lot better in predicting peoples future nature use than mutualism is. Analyzing the four sub concepts from the basic beliefs model point of view, 21% of the variability of peoples future nature affiliation (typical relationship of medium effect size) was predicted by this model and again 14% of the variability of peoples future nature use (typical relationship or medium effect size). The social affiliation belief proved to be the best predictor of peoples' future nature affiliation and the hunting belief predicts best peoples future nature use.

Table 18: Predictive relation of wildlife value orientations towards future nature behaviour

Model variable	*Future nature interests*			Future nature affiliation			Future nature use		
	Total	B.T.	S.B.	Total	B.T.	S.B.	Total	B.T.	S.B.
Wildlife value orientation (A. R^2)	.12 ***	.13 ***	.09 ***	.20 ***	.23 ***	.16 ***	.14 ***	.16 ***	.12 ***
Domination (β)	.36 ***	.39 ***	.33 ***	-.01	.02	-.04	.40 ***	.42 ***	.36 ***
Mutualism (β)	.24 ***	.26 ***	.20 ***	.45 ***	.50 ***	.38 ***	.04	.04	.03
Basic beliefs (A. R^2)	.12 ***	.14 ***	.09 ***	.21 ***	.24 ***	.17 ***	.14 ***	.16 ***	.12 ***
Appropriate use (β)	.14 ***	.14 **	.12 *	-.09 **	-.06	-.13 **	.19 ***	.19 ***	.19 ***
Hunting (β)	.31 ***	.33 ***	.28 ***	.08 *	.08	.08	.29 ***	.33 ***	.26 ***
Social affiliation (β)	.14 **	.18 **	.08	.27 ***	.31 ***	.22 ***	.02	.05	-.02
Caring (β)	.12 **	.11	.14 *	.23 ***	.24 ***	.20 **	.02	-.00	.05

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

In the Bukit Timah Nature Reserve sample, the wildlife value orientations model predicted 13% of the variability of peoples future nature interests, which corresponds to a typical relationship or a medium effect size. In the case of the future nature interests concept the domination variable turns out to be a better predictor than the mutualism variable. The basic beliefs model predicted 14% of the variability of peoples future nature interests, indicating a typical relationship or a medium effect size. The best predictor in the case of peoples' future nature interests is the hunting belief. Continuing now with the two sub concepts future nature affiliation and future nature use, the model based on wildlife value orientations predicted 23% of the variability of peoples future nature affiliation, which can be described as a typical relationship or medium effect size. Mutualism appears to be a lot better in predicting peoples future nature affiliation than domination. This model also predicted 16% of the variability of peoples future nature use, which also indicates a typical relationship or medium effect size. In this case domination is a lot better in predicting the variabilities. Analysis with the basic beliefs model shows a 24% prediction of the variability of peoples future nature affiliation (substantial relationship or large effect size) and a 16% prediction of the variability of peoples' future nature use (typical relationship or medium effect size). The social affiliation belief is best at predicting peoples future nature affiliation. The hunting belief predicts best peoples future nature use.

In the Sungei Buloh Wetland Reserve sample, the wildlife value orientations model predicted 9% of the variability of people their future nature interests which translates to a minimal relationship or a small effect size. The future nature interests of people is best predicted by the domination variable. Looking at the model based on the basic beliefs, it can according to the data predict 9% of the variability of peoples' future nature interests, corresponding to a minimal relationship or small effect size. The basic belief that best predicts the future nature interests of people is the hunting belief. Analysing first the two sub concepts future nature affiliation and future nature use with the wildlife value orientations model results in a prediction of 16% of the variability of the future nature affiliation of people (typical relationship or medium effect size) and a prediction of 12% of the variability of the future nature use of people (typical relationship or medium effect size). Mutualism is a very good predictor of the variability of peoples' future nature affiliation, but a very bad one in terms of peoples future nature use. Contrary, domination proves to be a very good predictor of the variability of peoples' future nature use, but a

very bad one in terms of peoples future nature affiliation. Analysis with the basic beliefs model illustrates a 17% prediction of the variability of people their future nature affiliation, corresponding to typical relationship or medium effect size, and a 12% prediction of the variability of people their future nature use, corresponding also to a typical relationship or medium effect size. The social affiliation belief is best at predicting the variability of the future nature affiliation of people. On the other hand, the hunting belief does predict best the variability of the future nature use of people.

6.2.2. Predictive relation of wildlife value orientations towards wildlife conservation support

In the total sample size, the wildlife value orientations model, based on domination and mutualism as independent variables, predicted 25% of the variability of peoples conservation support (substantial relationship or large effect size). In the case of peoples conservation support the mutualism variable proved to be a better predictor than the domination variable. The basic beliefs model, based on appropriate use, hunting, social affiliation and caring beliefs as independent variables, predicted 27% of the variability of peoples conservation support (substantial relationship or large effect size). The social affiliation belief proved to be the best predictor in the case of peoples' conservation support. Analysing the two sub concepts of conservation support with the wildlife value orientations model resulted in a 31% prediction of the variability of peoples wildlife conservation knowledge (substantial relationship or large effect size) and 9% of the variability of peoples' view on animal species protection (minimal relationship or small effect size). For both the sub concepts wildlife conservation knowledge and animal species protection, mutualism proved to be a better predictor than domination. The basic beliefs model predicts 32% of the variability of the wildlife conservation knowledge sub concept (substantial relationship or large effect size) and 12% of the variability of the animal species protection sub concept (typical relationship or medium effect size). The caring belief is best in predicting peoples' wildlife conservation knowledge, whereas the appropriate use belief is best in predicting peoples' view on animal species protection.

Table 19: Predictive relation of wildlife value orientations towards wildlife conservation support

Model variable	***Conservation support***			**Wildlife conservation knowledge**			**Animal species protection**		
	Total	B.T.	S.B.	Total	B.T.	S.B.	Total	B.T.	S.B.
Wildlife value orientation (A. R^2)	.25 ***	.28 ***	.22 ***	.31 ***	.33 ***	.29 ***	.09 ***	.10 ***	.08 ***
Domination (β)	-.12 ***	-.09 *	-.14 **	-.06 *	-.08	-.04	-.13 ***	-.08	-.20 ***
Mutualism (β)	.45 ***	.49 ***	.39 ***	.53 ***	.54 ***	.52 ***	.23 ***	.29 ***	.16 **
Basic beliefs (A. R^2)	.27 ***	.28 ***	.26 ***	.32 ***	.33 ***	.30 ***	.12 ***	.12 ***	.13 ***
Appropriate use (β)	-.19 ***	-.14 **	-.25 ***	-.09 **	-.07	-.12 *	-.23 ***	-.17 **	-.30 ***
Hunting (β)	.05	.03	.07	.01	-.03	.06	.07	.08	.05
Social affiliation (β)	.27 ***	.27 ***	.27 ***	.28 ***	.26 ***	.29 ***	.18 ***	.19 **	.16 **
Caring (β)	.23 ***	.28 ***	.16 **	.31 ***	.33 ***	.29 ***	.08	.14 *	.00

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

In the Bukit Timah Nature Reserve sample, the wildlife value orientations model predicted 28% of the variability of peoples' conservation support, which corresponds to a substantial relationship or a large effect size. In this case the mutualism variable turns out to be a better predictor than the domination variable. The basic beliefs model also predicted 28% of the variability of peoples' conservation support, indicating a substantial relationship or

a large effect size. The caring belief is the best predictor here of this concept. The basic beliefs model predicts 33% of peoples wildlife conservation knowledge (substantial relationship or large effect size) and 12% of peoples view on animal species protection (typical relationship or medium effect size). The basic belief that predicts best people their wildlife conservation knowledge is the caring belief, whereas the social affiliation belief is in this case best in predicting people their view on animal species protection. When analysing the two sub concepts wildlife conservation knowledge and animal species protection with the wildlife value orientations model results in a 33% prediction of the variability of peoples wildlife conservation knowledge which corresponds to a substantial relationship or large effect size. It also results in a 10% prediction of the variability of peoples' view on animal species protection, corresponding to a minimal relationship or small effect size. For both these sub concepts mutualism proved to be a lot better in predicting the variability than domination.

In the Sungei Buloh Wetland Reserve sample, the wildlife value orientations model predicted 22% of the variability of people their conservation support which translates into a typical relationship or a medium effect size. The conservation support of people is best predicted by the mutualism variable. The basic beliefs model predicts 26% of the variability of peoples' conservation support, corresponding to a substantial relationship or large effect size. For the conservation support concept the social affiliation belief is its strongest predictor of variability. Using the wildlife value orientations model to predict the variability of people their wildlife conservation knowledge results in a 29% prediction, indicating a substantial relationship or large effect size. It also results in a 8% prediction of the variability of people their view on animal species protection, indicating a minimal relationship or small effect size. In the case of the wildlife conservation sub concept, mutualism is a very strong predictor of the variability contrasting the domination variable. Whereas in the case of the animal species protection sub concept, domination is the best predictor of variability. Continuing with the other two sub concepts, the basic beliefs model predicts 30% of the variability of the wildlife conservation knowledge of people and 13% of the variability of the view of people on animal species protection. These numbers correspond to a substantial relationship or large effect size and to a typical relationship or medium effect size. The basic beliefs that best predict the variability of peoples' wildlife conservation knowledge are the social affiliation belief and the caring belief. For the sub concept of animal species protection the appropriate use belief can be seen as the best predictor of its variability.

6.2.3. Predictive relation of wildlife conservation support towards future nature behavior

In the total sample size, conservation support as an overall independent variable can predict only 4% (minimal relationship or small effect size) of the overall dependent variable of future nature interests. However, the future nature affiliation sub concept can be predicted in its variability for 42% by the conservation support concept (substantial relationship or large effect size). But the future nature use sub concept does not differ from the future nature interests concept in terms of predictability of its variability and is also 4% (minimal relationship or small effect size). The sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge, but also the animal species protection sub concept has relatively good predictive power towards future nature interests of people. The same applies for the sub concept future nature affiliation where wildlife conservation knowledge is also best in predicting and the animal species sub concept here too is relatively strong in predicting this. For the future nature use concept the situation is different, the best (and only) predictor is the animal species protection sub concept.

Table 20: Predictive relation of wildlife conservation support towards future nature behaviour

Model variable	*Future nature interests*			Future nature affiliation			Future nature use		
	Total	B.T.	S.B.	Total	B.T.	S.B.	Total	B.T.	S.B.
Conservation support (A. R^2)	.04 ***	.06 ***	.03 **	.42 ***	.42 ***	.41 ***	.04 ***	.05 ***	.03 **
Wildlife conservation knowledge (β)	.22 ***	.25 ***	.18 **	.58 ***	.61 ***	.55 ***	-.05	-.02	-.07
Animal species protection (β)	-.11 **	-.16 **	-.06	.13 ***	.09 *	.18 ***	-.19 ***	-.22 ***	-.14 **

*Significant at p < .05, **Significant at p < .01, ***Significant at p < .001

In the Bukit Timah Nature Reserve sample, the conservation support independent variable can predict only 6% of the variability of people their future nature interests. This corresponds with a minimal relationship or small effect size. 42% of the variability of the future nature affiliation intentions of people can be predicted by their conservation support attitude, this can be described as a substantial relationship or large effect size. However, the future nature use sub concept is not like this, only 5% of the variability of this sub concept can be predicted by the conservation support concept which means a minimal relationship or small effect size between the two. The sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge. But also the animal species protection sub concept has relatively good predictive power towards future nature interests of people. This applies even more so for the future nature affiliation sub concept where wildlife conservation knowledge is also best in predicting. For the future nature use concept the best (and only) predictor is the animal species protection sub concept.

In the Sungei Buloh Wetland Reserve sample, the independent variable of conservation support can predict no more than 3% of the variability of peoples' future nature interests. This means that the relationship is minimal between the two or the effect size is small. 41% of the variability of the future nature affiliation intentions of people can be predicted by their conservation support attitude, or in other words, this is a substantial relationship or large effect size. In contrast, the future nature use sub concept is nothing like this, only 3% of the variability of this sub concept can be predicted by the conservation support concept which translates into a minimal relationship or small effect size. The sub concept of conservation support that best predicts peoples' future nature interests is wildlife conservation knowledge. For the future nature affiliation sub concept the best predictor of its variability is also wildlife conservation knowledge followed by the animal species sub concept which still is a good predictor as well. For the future nature use concept the best (and only) predictor is the animal species protection sub concept.

6.3. Overall conclusion

The objective of this research was to better understand nature and wildlife based leisure and recreation in Singapore. The way in which this was done was by studying the wildlife value orientations, future wildlife based intentions and wildlife conservation support attitudes of people visiting two nature parks in Singapore: Bukit Timah Nature Reserve and Sungei Buloh Wetland Reserve. By looking at the predictive relations between these three concepts this research tried to understand to what extent people their wildlife value orientations can predict their future wildlife based intentions and wildlife conservation support attitudes, as well as if peoples' wildlife conservation support can predict their future wildlife based intentions. It is reasoned that the outcomes might help to better understand

why people participate in nature and wildlife based recreation and what role their wildlife value orientations play in here. This research demonstrated that there is in general a typical relationship (or medium effect size) between people their wildlife value orientations and their future nature-based intentions. It also showed that there is in the Bukit Timah sample as well as in the Sungei Buloh sample almost the same typical relationship (or medium effect size) between visitors their wildlife value orientations and their future nature-based intentions. This means that the wildlife value orientations of people can predict to a certain extend what the future nature-based intentions of people might be. So investigating peoples' wildlife value orientations could be very useful in developing wildlife and nature management in such a way that it will meet the needs of future visitors without compromising the protection of nature and wildlife.

This study also made clear that there is in general a substantial relationship (or large effect size) between people their wildlife value orientations and their wildlife conservation support attitudes. As well as in the Bukit Timah sample as in the Sungei Buloh sample there is almost the same substantial relationship (or large effect size) between visitors' wildlife value orientations and their wildlife conservation support attitudes. This brings the conclusion that the wildlife value orientations of people can predict with high certainty what the wildlife conservation support attitudes of people might be. In its turn this could have far going implications in the development of wildlife and nature conservation projects in and around nature areas as visitors their wildlife value orientations are very strong indicators for support or opposition of nature and wildlife conservation.

Lastly this research showed that there is in general a minimal (or small effect size) between people their wildlife conservation support attitudes and their future nature-based intentions. In the Bukit Timah sample and the Sungei Buloh sample there is almost the same minimal relationship (or small effect size) between visitors' wildlife conservation support attitudes and their future nature-based intentions. What can be concluded here is that the wildlife conservation support attitudes of people can predict a small part of what the future nature-based intentions of people might be. The implications of this result for nature and wildlife management are therefore a little less useful than the wildlife value orientations outcomes. Basing future management plans on peoples' wildlife conservation support attitudes is therefore advisable in combination with peoples' wildlife value orientations.

Taken all of the above together it can be concluded that peoples' wildlife value orientations are very useful in anticipating and developing future nature and wildlife conservation projects in the Bukit Timah nature reserve and Sungei Buloh wetland reserve in Singapore, and maybe also in other nature areas in Singapore. If similar outcomes outside of these two cases are also produced in other parts of the world, can only be stated with certainty if similar research is done. This promising start hopefully encourages further research at different locations all over the world, creating a dependable source of information for future nature and wildlife conservation management difficulties both in urban areas as well as in rural parts.

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8. Appendices

8.1 Questionnaire nature based leisure Singapore

NATURE AND WILDLIFE BASED LEISURE

The aim of this study is to examine how people view wildlife and nature. Wildlife is considered as 'animals who are living freely in the wild'. The survey contains four parts and takes about 10 minutes to complete. There are no right or wrong answers, it is just about your opinion. To ensure a result as complete as possible, it is important that you answer all the questions. Every response will be treated as confidential. By participating in this survey you are helping me completing my MSc research for Wageningen University in the Netherlands. Thank you for your cooperation and valuable time.

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Theme I: Thoughts about wildlife, fish and environment

Please circle one number which represents best how much you agree or disagree with each statement below:

–3: Strongly disagree
–2: Disagree
–1: Slightly disagree
0: Neutral
1: Slightly agree
2: Agree
3: Strongly agree

	Strongly disagree ..... Strongly agree						
1. Humans should manage wildlife and fish populations in such a way that humans benefit	–3	–2	–1	0	1	2	3
2. The needs of humans should take priority over wildlife and fish protection	–3	–2	–1	0	1	2	3
3. It is acceptable when people kill wildlife if they think it poses a threat to their life	–3	–2	–1	0	1	2	3
4. It is acceptable when people kill wildlife if they think it poses a threat to their property	–3	–2	–1	0	1	2	3
5. It is acceptable to use wildlife and fish in research even if it may harm or kill some animals	–3	–2	–1	0	1	2	3
6. Wildlife and fish are on earth primarily for people to use	–3	–2	–1	0	1	2	3
7. We should strive for a world where there is an abundance of wildlife and fish for hunting and fishing	–3	–2	–1	0	1	2	3

	Strongly disagree ..... Strongly agree						
8. Hunting is cruel and inhumane to the animals	–3	–2	–1	0	1	2	3
9. Hunting does not respect the lives of animals	–3	–2	–1	0	1	2	3
10. People who want to hunt should be provided the opportunity to do so	–3	–2	–1	0	1	2	3
11. Wildlife habitat and human living space should be separated (should be at different locations)	–3	–2	–1	0	1	2	3
12. Wildlife should not enter human living space	–3	–2	–1	0	1	2	3
13. Humans should not interfere with wildlife	–3	–2	–1	0	1	2	3
14. We should strive for a world where humans and wildlife/fish can live side by side without fear	–3	–2	–1	0	1	2	3
15. I view all living things as part of one big family	–3	–2	–1	0	1	2	3
16. Animals should have rights similar to the rights of humans	–3	–2	–1	0	1	2	3
17. Animals are like my family and I want to protect them	–3	–2	–1	0	1	2	3
18. I care about animals as much as I do care about other people	–3	–2	–1	0	1	2	3

	Strongly disagree ..... Strongly agree						
19. It would be more rewarding for me to help animals rather than people	–3	–2	–1	0	1	2	3
20. I take great comfort in the relationships I have with animals	–3	–2	–1	0	1	2	3
21. I feel a strong emotional bond with animals	–3	–2	–1	0	1	2	3
22. I value the sense of companionship I receive from animals	–3	–2	–1	0	1	2	3

Theme II: Future interests

Please circle one number which represents best how much you agree or disagree with each statement below:

–3: Strongly disagree
–2: Disagree
–1: Slightly disagree
0: Neutral
1: Slightly agree
2: Agree
3: Strongly agree

	Strongly disagree ..... Strongly agree						
1. I am interested to go watching wildlife in their natural habitat in the future	–3	–2	–1	0	1	2	3
2. I am interested to go fishing in the future	–3	–2	–1	0	1	2	3
3. I am interested to go hunting/trapping wildlife in the future	–3	–2	–1	0	1	2	3
4. I am interested to visit nature areas in the future	–3	–2	–1	0	1	2	3
5. I am interested to help protect nature and wildlife in the future	–3	–2	–1	0	1	2	3
6. I am interested to learn more about nature and wildlife in the future	–3	–2	–1	0	1	2	3

Theme III: Wildlife conservation support

Please circle one number which represents best how much you agree or disagree with each statement below:

–3: Strongly disagree
–2: Disagree
–1: Slightly disagree
0: Neutral
1: Slightly agree
2: Agree
3: Strongly agree

	Strongly disagree ..... Strongly agree						
1. I am interested in learning about wildlife conservation	–3	–2	–1	0	1	2	3
2. I often think about whether my actions harm wildlife	–3	–2	–1	0	1	2	3
3. I search and look for information about wildlife conservation	–3	–2	–1	0	1	2	3
4. I have knowledge about wildlife conservation	–3	–2	–1	0	1	2	3
5. I do volunteer work for a wildlife conservation organization	–3	–2	–1	0	1	2	3
6. I donate money to a wildlife conservation organization	–3	–2	–1	0	1	2	3
7. I want to do everything I can to protect and conserve wildlife	–3	–2	–1	0	1	2	3
8. I understand the impact of my actions on wildlife conservation	–3	–2	–1	0	1	2	3

	Strongly disagree ..... Strongly agree						
9. I am interested in finding out more about wildlife conservation	–3	–2	–1	0	1	2	3

10. I do my best to avoid doing things that might hurt or destroy wildlife habitat	–3	–2	–1	0	1	2	3

In general, how much do you agree or disagree with the conservation of the animals listed below? Please tick ONE box to indicate your level of (dis)agreement for each animal below:

Animals	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. Bat	☐	☐	☐	☐	☐	☐	☐
2. Bear	☐	☐	☐	☐	☐	☐	☐
3. Beetle	☐	☐	☐	☐	☐	☐	☐
4. Crocodile	☐	☐	☐	☐	☐	☐	☐
5. Deer	☐	☐	☐	☐	☐	☐	☐
6. Eagle/Hawk	☐	☐	☐	☐	☐	☐	☐
7. Elephant	☐	☐	☐	☐	☐	☐	☐
8. Lizard	☐	☐	☐	☐	☐	☐	☐
9. Monkey	☐	☐	☐	☐	☐	☐	☐
10. Parakeet/Parrot	☐	☐	☐	☐	☐	☐	☐
11. Shark	☐	☐	☐	☐	☐	☐	☐
12. Snake	☐	☐	☐	☐	☐	☐	☐
13. Spider	☐	☐	☐	☐	☐	☐	☐
14. Tiger	☐	☐	☐	☐	☐	☐	☐
15. Wild boar	☐	☐	☐	☐	☐	☐	☐

Theme IV: Demographic background

Please fill in the blank or tick your answer for each question:

Please write your age:

_____ years

Please indicate your gender:

- Male
- Female

Please indicate if you are a Singaporean citizen or not:

- I am a Singaporean citizen
- I am not a Singaporean citizen, I am from (country)
  _____

Please indicate your cultural background:

- Not applicable
- Malay
- Chinese
- Indian
- Other _____

Please indicate your level of education:

- No formal education
- Primary school
- Secondary school
- Apprenticeship/vocational education
- College/university

Please indicate your religious belief:

- Not applicable
- Islam
- Buddhism
- Christianity
- Hinduism
- Other _____

Please indicate your monthly income in US dollars:

- 0 to 2500 USD
- 2500 to 5000 USD
- 5000 to 7500 USD
- 7500 to 10.000 USD
- More than 10.000 USD