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Design principles to foster respect for nature in video games

Faculty of Arts

Department of Game Design

Author: Goutham Jayaraman

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Supervisor: Rainforest Scully-Blaker

Examiner: Sarah Lynne Bowman

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Abstract

Video games are critical and relevant tools which can be used to influence perceptions of nature. Many games have already sought to educate players about environmental issues, but the effect that games as a whole have on players' respect for nature is yet uncertain. This thesis thus aims to investigate this issue by conducting a game analysis based on a framework of respect for nature, which will be established as a foundational aspect of this paper. From the game analysis, lessons and design principles that can be employed in future game design to foster respect for nature in players will be collated.

Abstrakt

Videospel är kritiska och relevanta verktyg som kan användas för att påverka uppfattningen av naturen. Många spel har redan försökt utbilda spelare om miljöfrågor, men effekten som spel som helhet har på spelarnas respekt för naturen är ännu osäker. Denna avhandling syftar således till att undersöka denna fråga genom att genomföra en spelanalys baserad på ett ramverk av respekt för naturen, vilket kommer att fastställas som en grundläggande aspekt av denna uppsats. Från spelanalysen kommer lärdomar och designprinciper som kan användas i framtida speldesign för att främja respekt för naturen hos spelare att samlas in.

Key Words

Respect, Nature, Video Games, Biocentric, Game Design, Environment, Animals, Nonhumans, Climate Change, Ecology, Human-Nature Relationship

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1 Introduction

Some of the most pressing issues facing the planet today are the slew of ecological crises that have been slowly but surely building up over the decades. These crises include, but are not limited to Climate Change, Biodiversity Loss, Deforestation, and Pollution. Most, if not all of these problems are propagated by a poor human-nature relationship (Braito et al., 2017). Normally, these problems are left for governments and larger organizations to handle, but we are increasingly observing movements and initiatives in a society gradually gaining awareness of the world at large (Killingsworth & Palmer, 2012). While these initiatives typically involve protests, campaigns, or volunteering, the potential of video games has yet to be fully tapped. While research has been centered around the use of games to educate players around climate change or environmental concepts, insufficient attention has been given to the influence games might have on the wider population when it comes to shaping their respect for nature.

Respect for nature is treating all life as equal and ensuring minimal disturbances to the environment. It is viewing the world from a biocentric lens rather than the modern anthropocentric lens, which is largely encouraged by human society and thus makes its mark in popular media, including video games. While education about environmental concepts is indeed important and can be impactful in fostering respect, it does not take into consideration these societal norms which can be found in many games, even if they may not be designed with environmentalism in mind. For this reason, this thesis will analyze games from across the industry and explore how they represent respect, or conversely, disrespect for nature, thereby additionally exploring the effect they may have on a person's respect for nature. This thesis will aim to show that these representations can have a significant influence and are a real cause for concern, especially when they reaffirm already prevalent societal norms. In doing so, the thesis hopes to glean valuable learning points and explore possibilities for future game design aimed at improving this relationship with nature.

As a brief outline, the thesis will begin by stating the relevant research questions and then offer a more thorough unpacking of what "respect for nature" entails. Similar research conducted on the topic will be evaluated in a short literature review in the hopes of illustrating which areas are heavily researched and which areas are in need of further attention. This will also better explain why this thesis is not only concerned with education, but with games of a more general scope. Seeing as the chosen method for this thesis is a game analysis, categorization and selection criteria will be laid out before proceeding with the analysis proper. As a consequence of the analysis, design guidelines and best practices will be suggested that can be adopted by any prospective game wishing to foster a greater respect for nature among their players. This is done not just as a reference for myself as a game developer, but also for other developers or studios who may one day decide to undertake this very task and hopefully find this paper useful to that end.

2 Research Question

This thesis aims to ask the question “How do video games influence respect and disrespect for nature?”. However, the question of influence cannot be answered without the aid of experiments and observations of players, and hence will be limited to theorizations throughout this paper. Therefore, this thesis instead aims to ask “How do video games represent respect and disrespect for nature?”. Because this thesis is ultimately concerned with advising game design, this question then extends into “How can video games be designed to foster respect for nature?”.

Since respect for nature involves treating all life as equal and minimizes disturbance to the environment, nature can be broken down into two major components: *Environment* and *Nonhumans*. Thus, the initial research question can be expanded into:

- “How do video games represent respect for the environment?”
- “How do video games represent respect for nonhumans?”
- “How do video games represent disrespect for the environment?”
- “How do video games represent disrespect for nonhumans?”
- “How can video games be designed to foster respect for the environment?”
- “How can video games be designed to foster respect for nonhumans?”

Note that this thesis is not concerned with the direct impact that the action of playing video games has on the environment, as that is dependent on external factors such as energy production, hardware, usage patterns and playing time (Mills et al., 2019).

3 Background

In the following section, I will disclose my personal beliefs and stance on the topic of nature, as it will undoubtedly carry some bias in the arguments and analyses I will later make. I will then elaborate on the theoretical framework that will shape my game analysis, both by building up a definition of “Respect for Nature” and by offering a categorization strategy for finding and grouping games. The literature review mentioned in the introduction will also be included in this section.

3.1 Reflexivity and Positionality

I have been deeply passionate about animals and the environment since a young age. However, my eyes only became truly open to the reality of societal human-nature relationships when I discovered caged crows in Japanese parks. This further snowballed after witnessing several cruel bird cullings in my hometown Singapore and revealing the hidden truths behind factory farming while studying online courses. Over the following years, any respect, faith, and connection I had

for humans slowly dissolved away as I continually observed a wide variety of destructive behaviors being performed on a daily basis.

As such, my present worldview is one that is largely biocentric. I consider humans as animals and nonhumans as people. In other words, I consider all species to be equal and each individual deserving their own right to life. Humans are not superior to, not more intelligent than and not more important than other species. You may notice me always referring to a nonhuman as he/she/they, or as a person, which might appear strange to some. This is simply my natural way of writing, even if it is admittedly grammatically pointless to use "animals" and "people" interchangeably.

Please do understand that my worldview will influence my game analysis and other relevant discussions to follow. Please do also understand that the strong feelings I have developed for society and humanity do not make the issues discussed in this paper any less relevant. As I do still remain a part of human society and remain a constant witness to its practices, I have had ample time to formulate thoughts about it. This is precisely what has willed me to write about this topic and enables me to provide opinions or make deductions that are rare to come across from papers, journals, articles, and other forms of media.

While my definition of respect for nature is influenced largely by personal views, the theoretical framework for this thesis has been informed by another author who has written on the subject (Taylor, 2014) and offered a more concrete definition of the term.

3.2 Theoretical Framework: Respect for Nature

Respect for nature is a “certain moral attitude towards nature that has a central place in the foundations of a life-centered system of environmental ethics” (Taylor, 2014) - To have respect for nature, one must move away from an anthropocentric viewpoint and towards a biocentric viewpoint, something that respectfully assigns all life forms equal value. Interspecies relationships are important in the sense that all living beings have a role to play in contributing to ecosystem health and that they are all "teleological centers of life in the sense that they are pursuing their own good in their own way" (Taylor, 2014). Respect for nature also includes enacting fair laws and refraining from harm, destruction, deception, or abuse of other living beings - especially those of increased gullibility and vulnerability - and the environment. Environmental interference should also be avoided, even if they may come with good intentions as letting nature take its course often leads to the best outcome.

Taylor (2014)'s definition provides a solid starting point for the purposes of this thesis, but my definition moves past this to encompass society and lifestyles, namely the day-to-day activities and behaviors that are often taken for granted, such as needless wastage or overuse of food, electricity, and other resources. It should be noted though that many scholars writing in this area,

including Taylor (2014), Boylan (2014), and others I will cite later such as Chang (2019) or Haraway (2013), still maintain a relatively positive or neutral image of humans and society whereas I hold a more negative view. Humans are indeed supposed to be animals and an integral part of their ecosystem and natural community (Boylan, 2014), but this can only be true so long as they maintain a healthy relationship with the world around them. I so far unfortunately fail to observe this in the vast majority. I thus feel that humans have lost their status as animals and can only hope to reclaim that valuable title by deepening their bonds with nature. As a human living in human society, there are some parts of me I dislike and know require improvement. For example, even if I may prioritize sustainability, biocentrism and noninterference in my daily life, my relationship with nature remains one-sided, taking, but giving nothing back. However, as mentioned earlier, such an opinion may at least entitle me to provide unique arguments that can hopefully shed light and provoke discussions on unexplored or underexplored realms within this subject matter.

In this thesis, my sense of having respect for nature can, as mentioned earlier, be broken down into having respect for the *environment* and having respect for *nonhumans*.

Nonhumans, in a realistic context, refer mainly to animals and plants. In the context of video games, nonhumans additionally refer to imaginary creatures who are often analogous to animals.

Having respect for nonhumans means adopting the biocentric worldview as proposed by Taylor (2014), whereby all living beings have intrinsic value and are thus treated as equal centers of life without the addition of value from external sources. As an example, to the Swedish ecosystem, a wolf is no different from any other native carnivore, herbivore, or plant, as they are all important in maintaining environmental health. However, humans assign additional value to creatures based on their usefulness and friendliness to humans. This eventually results in discrimination, loss of respect, and detrimental activities such as the Swedish Wolf Cull in early 2023. This discrimination, better known as speciesism, is alarmingly common in human society and plays a huge role in the dehumanization of various nonhumans, especially of “vermin” or misunderstood species. On that note, truly invasive species can be considered a grey area as they can propagate damage or disturbance to their host environments. However, they can mostly be traced back to humans, who are undoubtedly the “most invasive species on this planet” (Marean, 2015). This is the reason, and also because humans are the only species to assign external value to other species, that we end up with biocentric and anthropocentric as two clashing views.

Respect for nonhumans also includes dietary choices and interspecies relationships. Even though an omnivorous diet is normal for humans, the current unsustainability of meat production makes it important to consider the origins of animal products and hence reduce meat consumption. Meat consumption may also promote dehumanization of livestock species which in turn translates to other species.

Interspecies relationships are indeed important and may aid in developing a respect for nature as they increase understanding, appreciation and provoke crucial thoughts (Haraway, 2013). However, having respect for nature is not necessarily in agreement with having companion animals, the most common source of interspecies relationships in society. This is a highly unpopular opinion due to the positive societal status and conferred benefits of companion animals such as cats and dogs, but it is vital not to ignore their ecological impacts (Martens, Su & Deblomme, 2019) (Dickman, 2009). The concept of companion animals is also in conflict with a biocentric worldview as it promotes anthropocentric speciesism and the ownership of other living beings, which ties to the deception of vulnerable minds unable to speak for themselves.

Regarding the environment, many aspects of respect were mentioned earlier, such as noninterference, sustainability, and resource usage.

Additionally, destructive behaviors such as smoking, littering and pollution (noise, light, air, water, and ground) are in conflict with and harm environments, nonhumans, and even humans, thereby necessitating their avoidance. For example, with smoking, although smoking cues in games may not strongly influence addiction to smoking, (Forsyth & Malone, 2016) it remains a normalized activity in games as it does in society, which is an issue to address. Even positively received games such as *Coffee Talk (2020)*, *Jake Hunter (2007)*, or other detective games make no attempts to paint smoking in a negative light.

Respect for the environment also includes keeping greenhouse gas emissions and carbon footprints low, although this is unlikely to be influenced by games. Additionally, while impact mostly comes from corporations, companies and governments, individual actions are still important (Schwenkenbecher, 2014). As previously stated in Section 2, I also understand that there are discussions surrounding the environmental impact of playing games themselves but will not be touching on that aspect for the purposes of this thesis.

To summarize, having respect for nature is to adopt a biocentric mindset, treat all life equally, promote healthy interspecies relationships, and minimize environmental interference. This topic is however broad and thus my analysis will focus more heavily on nonhumans and overarching environmental interactions, though will still ultimately attempt to touch on all the aforementioned points.

Taylor (2014) has offered a grounding for the definition of respect for nature and all the various principles it encompasses. However, with the sheer quantity of games available on just the Steam platform alone, there still exists the necessity to formulate criteria by which games can be organized. The following paper on climate change games helps allay that concern.

3.3 Theoretical Framework: Categorization

Climate Change is perhaps the most influential and widely recognized challenge facing the Earth today, and is the most popular topic that has been explored in conjunction with games, particularly when concerning education and classroom usage. In their paper on climate change games, Abraham & Jayemanne (2017) introduce concepts that cover not only climate change but other environmental or ecological issues that will be addressed in this analysis. Additionally, they cover a few examples of video games that have a connection to climate change, but crucially describe four categories by which the games have been grouped. These categories represent the different ways in which nature and environments are used in games, and have suggested a firm framework which my analysis utilized to search for games and identify arguments that are the most relevant to each method of environmental depiction.

These four categories are as follows:

First are environments which are a simple static element that are not relevant beyond aesthetics, thereby allowing zero interactions between the player and the environment.

Second are environments which exist as a resource to be exploited. Exploitation is a common mechanic found in many genres of games and proved to be a critical aspect to look for in games during the selection process. Building an environment that exists mainly for its resources ties into the reality of human expansion, by which humans spread out to every continent from their origins and replaced natural habitats with urban settlements that were only possible with the accrual of resources and loss of native lives. From examples such as open world survival craft games or base construction games, it seems apparent that games featuring exploitation trivialize the complex relationships between humans and the environment, thus sending the false message that environments can be exploited endlessly without consequence.

Third are environments which exist as obstacles to overcome. This ties into the idea of domination, where humans pride themselves as masters of nature, seeking to conquer all the challenges it has to offer and control nonhumans who are supposedly beings of lesser intelligence. While not as common as exploitation, domination is still a crucial mechanic to factor in as there exists the issue of whether games reinforce feelings of human superiority amongst players. Additionally, domination may also involve overcoming an environment which is characterized by obstacles, which is readily observed in 3D Platformers.

Last are environments which exist as something to explore, discover, and learn about, sometimes even from a historical perspective. Considering that respect for nature relies on non-interference, games which allow for immersion without the possibility of interference present a solid opportunity to foster respect for nature amongst players.

These classifications are vital building blocks by which to discover and classify games and arguments. Thus, this paper will inform my theoretical framework by directly providing the categories which will be used to structure my analysis. However, since the first of these four categories is not as relevant or useful as the other three, it will be discarded, and the fourth category will instead be split into education and exploration. While some similarities may exist between these two, educational games can be of any genre and are designed with the explicit intention of informing players about one or more topics surrounding environmentalism. Meanwhile, exploration hints at the focused mechanic of being immersed in natural environments.

We thus arrive at the four categories derived from this paper: Exploitation, Domination, Education and Exploration.

However, it is necessary to build on these four groups by adding two more that focus on nonhumans, seeing as they are a crucial component of my definition of respect for nature. The two additional categories added are hence Nonhumans and Interspecies Relationships

Having laid out the two main papers which have informed my theoretical framework and built a foundation for my thesis, it is now necessary to examine papers which cover similar topics surrounding environmentalism. Doing this may help ascertain which areas have been heavily researched and identify areas which require more attention and focus in this analysis. A literature review may also provide insights which cannot be readily acquired from examining games alone.

3.4 Literature Review

The exact term “respect for nature” is not very well represented, but there are a small number of other texts which have directly broached the topic. One paper, written by Martin, Maris & Simberloff (2016) talks about how nature has certain limits which need to be respected in order to ensure the health of the planet and of human society. The authors describe how development and economic progress are generally in conflict with respecting nature and are made at its expense. They highlight how society values things incorrectly and are hesitant to criticize themselves, especially when concerned with environmental issues. Additionally, they make a reference to the debate of anthropocentric versus biocentric that was established earlier. Modern ethical frameworks only assign intrinsic value and proper moral consideration to one species, and everything else has value corresponding to their contribution towards human ends. A number of additional issues and strategies are mentioned, but the ones most relevant to this thesis have to do with overarching human-nature relationships. Conservation efforts are largely focused at direct interventions, but if everyday humans, companies and governments were to have a solid respect for nature, that would work to mitigate environmental issues at their source rather than having to deal with the fallout. This supports the notion that games can make a difference if enough of them were to move away from regurgitating societal norms, concepts, and ideals. In other words,

a focal point of this game analysis would ultimately be the identification and subsequent undermining of anthropocentrism in the game industry.

In another paper written by Ärlemalm-Hagsér (2013), she talks about education being a powerful driving force of influencing perceptions about nature, focusing her discussion on preschoolers and their respect for nature. She mentions how even children at the age of 5 can display competence towards conservation and how they are able to maintain a more ecocentric view, even when personal motivations might be anthropocentric. On that note, she introduces “ecocentric” as a term where intrinsic value is relative to ecosystems rather than to life as in “biocentric”, although the two terms are functionally identical. She stresses that respect to nature needs to be inculcated at a young age and thus should be a mandatory aspect of school curriculum, which makes developing games to target children a relevant strategy in game design. Respect for nature is also strengthened by being outdoors, connected to nature and experiencing the feeling of being a part of something bigger. This relates to the exploration category discussed earlier, which implies that ideas revolving around exploration and education may be where game design would see the most success.

Indeed, the majority of research into environmentalism in video games does lean the most heavily on the category of education, with exploration being the second most commonly observed. In the paper “Ecoplay”, Bianchi (2019) discusses the concept of playing in nature, and uses the underwater exploration game *Abzû* (2016) as a case study. Ecoplay essentially defines its own theoretical framework and conducts a game analysis based on that framework, its targets being *Abzû* (2016) and *Jurassic World Evolution* (2018), both games where options for playing with nature are available in abundance, albeit in different ways. Ecoplay’s framework works to link elements of play theory to environmental issues, whereby play includes not just the mechanics of a game, but also personal experiences, values, and expression. It relies heavily on openness and accessibility to various interpretations. This implies that games can influence respect for nature by allowing for increased agency and by behaving more like toys. In doing so, players take the initiative to formulate thoughts and learn through self-discovery, which is an effective alternative to force feeding information.

Ecoplay is also inspired by two additional concepts: “Ecospeak” (Killingsworth & Palmer, 2012) and “Ecosee” (Dobrin & Morey, 2009). Ecosee is a framework that examines the “study and production of the visual representation of space, environment, ecology and nature in various forms of image-based media” (Dobrin & Morey, 2009). It takes into account image-based studies such as visual rhetorics or picture theory and analyzes the relationship between imagery and nature. It ultimately serves as a guideline for image use in media and can be relayed over to the games industry. Imagery in games can include characters, props, usable items, cutscenes and background elements among others, sometimes even extending to elements mostly restricted to other forms of media, such as advertisements. Ultimately, the images that players absorb when playing games are often taken at face value and can leave a strong impression, often without any

realization on their part. For this reason, appealing to the eyes is a technique relevant to this analysis, and one that game designers would need to account for.

Similar to Ecosee, Ecospeak is another framework, but one that references politics and communication rather than imagery. Ecospeak builds on how discourse can contribute to the formation of new ideas surrounding nature, and how the study of this discourse can be useful to the same end. It describes social movements that have been spurred in defense of nature and elucidates the different parties involved in environmental politics. Even though it broadly classifies discourse as either being for or against nature, it also shows that these opinions can be multifaceted. Unlike Ecoplay and Ecosee, Ecospeak does not make any direct references to games or media, but still can be useful to consider in game design as it stresses the importance of effective communication, collaboration, and understanding between parties who may have different priorities. This indirectly hints at the possible effectiveness of multiplayer-oriented design. It also hints at how tailoring conversations and dialogs to more strongly feature nature can in turn provoke thoughts and ideas that may be beneficial to the fostering of respect, even if this may take time to see results.

While there are many similar papers that could be mentioned, a paper on “Playing for the planet” (Patterson & Barratt, 2019) draws relationships between games and the UN’s 17 Sustainable Development Goals. Of these 17 goals, the paper displays which are the most represented in games based on a sample of 214 titles. Some notable examples like hunger, poverty, energy, and water are featured sparsely in comparison to topics such as health, climate change and biodiversity. The paper stresses how games are the fastest growing media industry and encouragingly shows examples of games already making an impact towards the goal of environmental conservation. This further supports the basic premise of this thesis, which is that games can indeed make a difference. In addition to this fact, it introduces six other recommendations that may be taken to heart. These bring to light interesting viewpoints such as how diverse player bases allow for the experimentation of countless novel strategies and ideas. It also touches on streaming and how it can have a powerful voice if used correctly, considering that gameplay viewership is becoming increasingly popular. These are all helpful considerations to make when analyzing or designing games.

Although the above sources are analyses or discussions, there are also experiments which have been conducted which can offer additional insights. For example, “QuitBet” (Bloom et al., 2021), used a system that functioned as a gameshow to get willing participants to bet on their determination and resilience with regards to abstinence from smoking. The app included education about the dangers of smoking and fueled personal motivation with the aid of money and social interaction. Some success was observed, although it may be biased since the participants wished to quit. Another experiment known as “Felino” (Westerlaken & Gualeni, 2014) explored the fascinating possibility of creating gameplay meant to foster interplay between members of multiple species. This could be a novel strategy to employ in game design as it

creates the opportunity to strengthen mutual respect and understanding between different species. However, the fact remains that this idea currently only applies to humans and companion species such as cats and dogs. Expansion to include other species is a significant challenge yet to be undertaken.

Research into the area of environmentalism in games is still an underexplored area, though it continues to receive greater attention. It is therefore necessary to continue designing games to encourage further discourse and research into the matter and firmly maintain the positivity of this trend.

4 Methodology

The method I have chosen to explore the issue of how games influence respect for nature is a game analysis that will be carried out on games from a variety of genres, many of which are presently published on the popular gaming platform Steam.

In her book "*Introduction to Game Analysis*", Fernández-Vara (2019) provides a useful framework to adopt whilst conducting my game analysis. Game analysis is to approach games as texts and to critically evaluate them whilst playing or watching them. They should be examined not in a vacuum but in relation to other texts, whether they are games or other forms of media. The analysis should also be conducted with crucial questions in mind that prioritize the aspects which are relevant to my thesis.

The following questions are the most relevant to this thesis:

- How is nature represented in the game? Nature includes both animals and the environment. Humans are counted as animals and hence part of nature.
- How does the game attempt to influence players' perception of nature, regardless of intentionality?
- In my opinion and according to the definition established earlier, in what ways is the game successful at promoting or undermining respect for nature?
- How can the game be tweaked to better foster respect for nature?
- What are the key takeaways from the game to be carried on to future projects?

As Fernández-Vara (2019) instructs in her book, it is necessary to break down each game into its various components, which may include characters, lore, mechanics, narrative, aesthetics, and immersion. How these components interact with environmentalism and influence the player's opinions surrounding nature will have to be examined. Connections should also be drawn between the game components and the contexts of culture, society and history, factors which heavily influence the human-nature relationship.

On that note, it is crucial that this thesis focuses not only on games designed with the intent to influence respect for nature but also games which may not have any links to nature at first glance. Such games are often played without the players having any precognitive thoughts about nature or environmental issues. This is especially applicable to AAA games which are typically consumed by a wide player base and thus have the ability to influence perceptions of a large population. As an example, the popular *Pokémon (1996 - 2023)* franchise is very widely played, and with narratives that are built around coercion and animal cruelty, it has had a strong influence on animal ethics, often sparking debates and spurring animal rights activists, even when considering the fact that Pokémon are imaginary creatures (Quijano, 2013). This influence stems from the powerful impact that popular media such as films and games have on the thoughts and perceptions of consumers, being able to reinforce or criticize preexisting notions (Quijano, 2013). This further echoes the points outlined earlier about not examining games in a vacuum or drawing connections between games and culture or society.

As outlined in the theoretical framework, my analysis will be guided by six categories, which have helped to find a good variety of games to analyze so as to cover a broad spectrum of the industry as a whole. However, it is important to understand that many of the games easily overlap multiple categories. For example, the ecosystem simulator *Eco (2018)* goes as far as covering all six categories. For this reason, the analysis will cover pertinent arguments relating to each category in turn and reference relevant examples from games. The same game may then be discussed within multiple categories. Throughout the analysis, I will also attempt to establish a list of design principles that can be carried over to prospective projects.

For the sake of familiarity, and because the sheer quantity of games in existence is vast, the games that will be focused on in this analysis are titles from my Steam Library which I have extensive experience with, or games from consoles which I have played previously. Games already discussed in length by other sources such as *Abzû (2016)* and *Jurassic World Evolution (2018)* in Ecoplay (Bianchi, 2019) may be less meaningful to analyze, but will still be used as examples where they have novel arguments to offer. Other than having familiarity, the selection criteria used requires a minimum of two games from each category. The games must display mechanics relevant to that category and heavily feature the environment as an element of gameplay. Additionally, the games must have a unique quality that provides a discussion point which only they can offer relative to the other games in the analysis.

There are however some limitations which must be stated before proceeding. Admittedly, the games I have chosen for this analysis do all have some degree of personal bias and thus so do the conclusions I have drawn from each one. These games are also limited in their coverage as it would be impossible to include every game with environmental significance available to the public. Regarding the research questions outlined earlier, this thesis has also not measured any real impacts on players as no experiments were carried out. All observations made would therefore be theoretical, and may or may not work in practice.

Regardless, the content in this thesis is still important to seriously consider as the reality yet remains that our planet continues to face numerous ecological crises. Personal observations have shown that humans generally do not think deeply about these issues as it does not affect or reflect on their daily lives. It is thus vital for games which help to raise questions, provoke discussions and engage minds to be birthed and challenge the vast majority of games that rely on an anthropocentric societal norm.

5 Game Analysis

Following the insights and limitations offered thus far, this section will cover the game analysis conducted as per the specifications listed in the methodology, simultaneously opening the important discussion of design principles that can be adopted into future game design.

To first establish an idea of anthropocentrism in game design with respect to the environment, we may start with the category of Exploitation.

5.1 Category - Exploitation

Exploitation is defined in games which treat the environment as a resource. This involves extraction of materials and living matter which then may or may not translate into development (Abraham & Jayemanne, 2017). This is commonly featured in genres such as open-world survival craft, settlement construction, farming, or RPGs. The importance of this category can thus be felt when considering the prevalence of exploitation mechanics in the games industry.

As a textbook example of exploitation, we may turn to the open-world survival game *Crashlands* (2016).

5.1.1 Crashlands

Crashlands (2016) follows an alien creature who crash-lands on another planet and sets out to repair their ship and escape. Gameplay involves exploring the environment, collecting resources, crafting, building, and fighting against other creatures roaming the world.

When discussing respect for nature, it is important to ensure that interference and destruction are avoided, and that all life is respected as per a biocentric worldview. In *Crashlands* (2016) however, we see the exact opposite. Everything attached to the land, whether living or nonliving, exists purely for the use of the protagonist, who themselves is an alien invader with zero connection to the host planet. Alien creatures are split into two categories. Either they are

friendly, or hostile, in which case they exist only as experience and resources. This creates a very strong and frightening distinction between “us” and “them” that is often seen in human society. In other words, “good”, “bad”, and “useful” are entirely defined by and dependent on the protagonist and the protagonist alone. This is a highly anthropocentric worldview which directly mirrors the relationships between humans and nonhumans. Additionally, a link can be made to colonialism, whereby a foreign power “discovers” a new land full of untouched nature that is ripe for exploitation, and perceives it as being in service for them. As history has shown, colonialism ultimately results in negative effects to the environment (Liboiron, 2021), and can still be seen today in the form of large-scale deforestation or urban expansion into natural habitats.



(Figure 1 - Speciesism)

(Personal Screenshot)

[In Crashlands (2016), there are friendly aliens you cannot kill, and there are aliens who you are encouraged to kill. They should however all be equal centers of life, especially on a foreign, unidentified planet]

Of greater consequence is the fact that the harvested materials or slain creatures will simply respawn. This is an extremely common issue seen throughout the games industry. For example, in *Battle Chef Brigade* (2017), *Monster Hunter Stories 2* (2021), and most other RPGs, plants and animals in the environment will endlessly respawn whenever the player leaves and re-enters an area. This is indicative of a world centered around the protagonist and should be avoided as it suggests that environments are endlessly exploitable and that losses in biodiversity will just be replaced on their own without consequence. It suggests that lives of foreign creatures have no

meaning beyond their provisions, which is in violation of them being centers of life in their own right.

This brings us to the first important design principle that games ought to follow. The game world should not be dependent on or centered around the player, or around any organism, community, society, or species. The Earth is its own center and does not revolve around humans or a particular group of humans. Game worlds should behave in a similar manner to reinforce this oft forgotten fact.

5.1.2 Battle Chef Brigade

The earlier mention of *Battle Chef Brigade (2017)* allows us to examine another crucial aspect of exploitation, namely hunting and by extension, fishing. *Battle Chef Brigade (2017)* is apt for this introduction because it is themed around food and monster combat. In the game, players are tasked with hunting monsters to acquire cooking ingredients which they use to prepare meals for a cooking tournament. A popular justification for the extraction of resources from an environment, especially food, is that of necessity. All organisms do, after all, require adequate nutrition to survive, and hunting is a natural daily process that occurs worldwide.

However, at fault here is not the mere act of hunting, but rather, the act of trivialization. Without any weight attached to life, extraction becomes exploitation. This can be seen clearly in *Battle Chef Brigade (2017)* and the aforementioned *Crashlands (2016)*. In fact, hunting and harvesting area trivialized to the extent that they form the crux of a popular sport, something unrelated to survival, and thus not done out of necessity. This is synonymous with real life activities such as foxhunts, bird shoots or trophies whereby hunting is linked to pleasure rather than survival. The value of life is undermined, and grave consequences await affected ecosystems.



(Figure 2 - Gameplay)

(Personal Screenshot)

[The gameplay loop in Battle Chef Brigade (2017) is to venture into a wild area to hunt and kill monsters, extract ingredients from them, and then return indoors to cook dishes with said ingredients. The notion that monsters exist solely to be exploited is very strong. For example, the wild areas start immediately out the door, and monsters always respawn.]

Trivialization is further stretched where it concerns fishing. Fish are the most marginalized animals in modern society, with over a trillion marine lives being lost to human activity on a yearly basis (Wickens, 2010). Countless RPGs feature fishing as a minigame, and fish in those games are almost always merely collectable items, often without any impression of life. Fish, once caught, - often with minimal effort - just vanish pointlessly into the inventory. A life has just been taken, and yet the life is not given due significance.

Having respect for nature means respecting the intrinsic value of life, which all organisms have. It thus follows that games should emphasize life as always having more value than anything nonliving. When actors in an ecosystem are removed, disturbed, or killed, meaningful and perceptible impacts of these actions should follow.

5.1.3 Eco

As a demonstration of the design tenets mentioned thus far, we may turn to *Eco (2018)*, an ecosystem simulator. Players spawn on a small planet with an impending asteroid strike. They must work to build a society advanced enough to destroy the asteroid, but must simultaneously be careful not to endanger the planet's fragile ecosystem.

While *Eco (2018)* has many educational qualities and will be more pertinent for discussions surrounding education, it is also entirely built around the concept of exploitation. After all, players begin with a pristine natural environment and are free to use it as they deem fit, which is similar to *Crashlands (2016)*. However, while *Crashlands (2016)* erodes the value of life, *Eco (2018)* instead bolsters it.



(Figure 3 - Destruction)

(MobyGames, 2018 <https://www.mobygames.com/game/102908/eco/promo/group-35627/image-329468/>)

[Destruction in *Eco (2018)* does not come without costs, and always has noticeable impacts]

Every action in *Eco (2018)* carries an impact. Cutting down trees, clearing land, hunting, fishing, construction, pollution, and even minor actions such as briefly driving a car all have a consequence. These consequences are noticeable as data on various models is always available for the player's viewing, and are relevant because they influence the ecosystem in readily apparent ways. For example, *Eco (2018)* comes equipped with population charts and supports extinctions. This stands in contrast to the gaming industry which allows players to kill and

harvest endlessly with zero consequences dealt to the environment. It allows *Eco (2018)* to foster respect for nature as it reminds players of the importance of life, and that they exist for the environment and not the other way around. Making player actions have an impact, with relevance to the game world, and ideally to the player, is thus a positive feature that games can employ.

As a summary of exploitation, we have seen that games commonly portray the environment as a resource which exists for the player's usage, and that games often end up having an anthropocentric, or player-centric worldview as a result. Mechanics such as fishing are a common and often pointless inclusion in games that ultimately undermines fish and normalizes the idea that marine environments are endlessly replenishable. Exploitation of natural ecosystems in real life has severe consequences that can never be ignored and thus, it is not recommended for games to trivialize nature in any way. Allowing flora, fauna and materials to endlessly respawn, allowing life to have lower value than nonlife, and encouraging interference should all be avoided as far as possible. Instead, games should strive for a biocentric worldview, placing importance on life, creating the sense that humans are part of the environment instead of the environment being in service of humans, and making actions have impact, however small they may be.

5.2 Category - Educational Games

Educational games are games that are designed with the explicit goal of teaching players about topics surrounding the environment. However, learning occurs in almost all games, whether they have an educational focus or not. The games featured in this category are not necessarily e-learning tools, but nonetheless impart valuable knowledge about environmental concepts which are not common to other games, and which are valuable to the discussion of respect for nature.

These concepts include aspects such as climate change, ecology, ethics, and sustainability among others. Admittedly, learning is the most researched topic when concerning environmentalism in games. In her book on *"Playing Nature"*, Chang (2019) has discussed or mentioned a large number of games with an educational focus or containing educational elements. Additionally, games have frequently been studied in the context of climate change as they are "natural tools for education and engagement" (Wu & Lee, 2015). They have the ability to place players in focused scenarios and become an effective source of first-hand experience (Wu & Lee, 2015) which cannot be acquired from learning through non-interactive mediums such as texts or videos.

With this in mind, it is clear that the concept of learning is important, relevant and perhaps the first crucial step to the fostering of respect for nature, thus necessitating the inclusion of this

category. In addition to *Eco* (2018), the games *EcoQuest* (1991) and *Werewolf the Apocalypse: Heart of the Forest* (2020) will hopefully provide new insights and design philosophies to adopt.

5.2.1 EcoQuest

In the Point-and-Click Adventure *EcoQuest* (1991), players follow Adam - the son and assistant of marine biologist Noah Greene - as he joins Delphineus the anthropomorphic dolphin on a quest to rescue the whale Cetus. *EcoQuest* (1991) seeks to teach players about the impacts of human activities on marine ecosystems by demonstrating them first-hand throughout the game in various ways.

Firstly, there are large quantities of discarded human items strewn about the ocean floor. These items take the form of nonbiodegradable plastic or electronic products and teach players about the effects of inappropriate waste disposal and plastic use. Players will notice that such visually striking items mar the surrounding environment and thus be compelled to assume their environmental responsibility and manually remove these items.



(Figure 4 - Pollution)

(MobyGames, 2014 <https://www.mobygames.com/game/584/ecoquest-the-search-for-cetus/screenshots/dos/700409/>)

[The underwater town of Eluria is heavily cluttered and the player has a recycling bag with a readily visible and accessible icon. This helps them understand the dangers of pollution and helps foster responsibility]

Secondly, *EcoQuest (1991)* makes references to toxic waste pollution, harmful byproducts being dumped into water bodies by industrial activity. As striking as it is, players may not be able to link the green goop in *EcoQuest (1991)* to anything familiar. Considering that litter is represented by easily recognizable objects to facilitate learning, toxic waste can similarly have a more focused depiction, perhaps of mercury, fuels, cosmetics, detergents, or pesticides, rather than something unidentifiable which may not contribute to learning.



(Figure 5 - Toxic Chemicals)

(Adventure Gamers, 1998 <https://adventuregamers.com/games/view/16660>)

[The toxic waste in EcoQuest (1991) is striking, but not readily identifiable]

EcoQuest (1991) also portrays harm directly caused to marine inhabitants. For example, the player encounters struggling creatures trapped in a fishing net and will eventually discover Cetus wounded by harpoons. These may help educate players about the very real impacts of fishing and whaling.



(Figure 6 - Fishnets)

(MobyGames, 2014 <https://www.mobygames.com/game/584/ecoquest-the-search-for-cetus/screenshots/dos/700409/>)

[A fishing net in the game, shown together with a large number of lost lives. This is not an exaggeration, and could help make the problems faced by marine animals more relatable]

These three examples as seen in *EcoQuest (1991)* can be classified as scare tactics or fear appeals, which can be employed in game design to hammer in the harsh realities of our modern world, and to promote sustainable behavior. Such fear appeals can additionally be observed in other forms of media to promote environmental activism, but have seen limited success (Shin, Ki, & Griffin, 2017). Their effectiveness will thus be dependent on the target audience, type of imagery included, game's intent, image frequency, and accuracy. Similar usage as seen in *EcoQuest (1991)* can have a sizable impact, although exaggeration is not always recommended. Alternatively, dystopian futures can be designed to convey fear appeals¹.

5.2.2 Werewolf the Apocalypse: Heart of the Forest

While not as directly frightening as the imagery shown in *EcoQuest (1991)* or the prospect of dystopia, the world of environmental politics is one that is terrifying in its own right, often being messy, cruel and difficult to comprehend. There are always numerous actors involved in the process each with their own goals and concerns, and implementing policies or protections can be

convoluted, requiring significant lengths of time. (Rosenbaum, 2016). It is helpful then that *Werewolf the Apocalypse: Heart of the Forest (2020)* makes an effort to condense this otherwise complicated world into a narrative that is much more easily grasped by players.

Werewolf the Apocalypse (2020) is an interactive fiction novel that follows the story of Bialowieza Forest and its logging problem. The player plays as Maia, a Garou (Human-Werewolf Hybrid) and together with other Garou, must work to stop the logging activities. To do so, there are a wide variety of approaches the player can take, ranging from peaceful to violent.

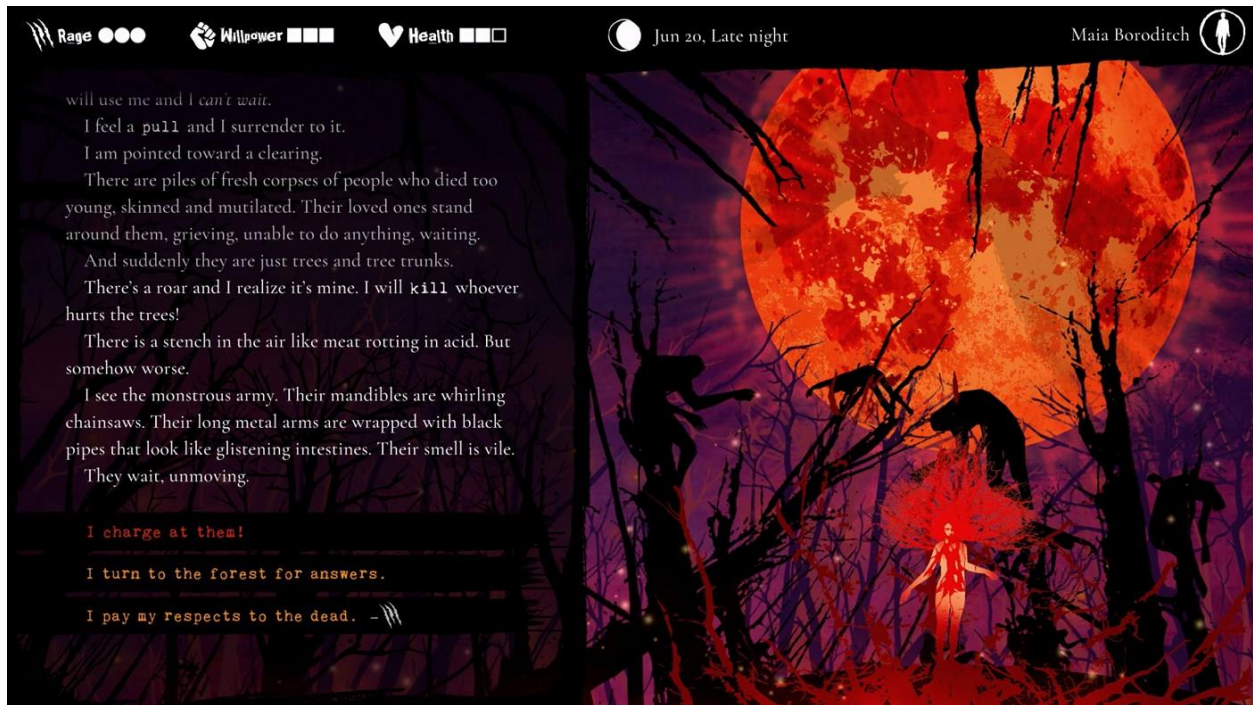
Throughout the game, players encounter various stakeholders, including politicians, journalists, activists, police, and locals. Several werewolf clans are also featured, each sharing the goal of protection, but differing in their views towards humans, ranging from reverence to wishing coexistence to outright destruction. Being presented with all these options and parties, the player then has to choose their personal approach, opting between diplomacy, protesting, subterfuge, or bloodshed. Some of these methods were mentioned in *Ecospeak* as examples of environmental activism (Killingsworth & Palmer, 2012). *Werewolf the Apocalypse (2020)* is thus a valuable and accurate window into concepts that are rarely seen in the industry.

More than just learning about politics, players are also forced to seriously question the value of human life in comparison to nonhuman life, especially when confronting the reality that humans are the ones displaying aggressive behavior. The mention of a supposedly invasive beetle as a justification for logging further pushes thoughts in this direction. Enabling player agency, forcing tough moral decisions, and accurate depictions of reality are thus useful design philosophies we can gather from *Werewolf the Apocalypse (2020)*.

A major concept that is common to both games is empathy. Empathy is the ability to feel the emotions of another being, and empathy has been connected to learning, altruism, and prosocial behavioral changes (Schrier & Farber, 2021), all of which can contribute to building respect for nature. *EcoQuest (1991)* attempts to foster empathy by depicting nonhumans as equals to humans and showcasing the damages and suffering they endure in a readily relatable manner. For example, humans may possess awareness of the impacts of fishnets, but are unable to empathize due to it being distant from society. Additionally, as mentioned earlier, players remain exposed to the itemization of fish in countless video games, further impeding any chance of empathy. By turning marine animals into lovable characters, *EcoQuest (1991)* challenges this notion and instead aims to build attachment towards them, educating players about their importance, and showing that empathy can be a useful tool to utilize in game design.

In *Werewolf the Apocalypse (2020)*, Bialowieza itself is depicted as an actor, which is a commendable approach to take. Indeed, the forest should be the most important actor here, but this is often overlooked in favor of human desires. This is similar to how “mining a mountain

would be good for humans but bad for the mountain” (Boylan, 2014). The forest is a living entity and has its own individuality and right to life. In the game, this is done by the forest conveying messages directly to the player, sharing its pains, fears and wishes. This helps to build empathy for something not typically even recognized as a living being, and is highly recommended as a feature in future games. Emphasizing the sights, sounds, feelings, and emotions experienced when inside a forest or any other habitat should be a helpful way to connect humans to nonhumans.



(Figure 7 - Forest as an Actor)

(Xbox One, 2021 <https://www.xboxone-hq.com/xboxone/games/werewolf-the-apocalypse-heart-of-the-forest/4518/screenshot-33945.html>)

[There are many scenes in the game where the forest is directly visualized as a living being, and speaks directly to the player. There are also scenes where the lives of loggers can be ended, at the choice of the player]

However, there is an issue with empathy that *EcoQuest (1991)* brings up. Does anthropomorphizing otherwise realistic nonhumans weaken the connection made between the in-game world and real life? Research into the topic supports the notion that children are attracted to anthropomorphic animals, and are able to learn effectively and apply their knowledge to real life after consuming media with anthropomorphic animals (Geerds, Van de Walle & LoBue, 2016). This can also translate to moral issues, and shows that *EcoQuest (1991)*'s attempts to increase respect for nature can potentially have a positive influence on children. However, it is uncertain whether this translates into adulthood or if it has the same effectiveness when adults are the target audience. In fact, with adults, it is likely that realistic animals will be more

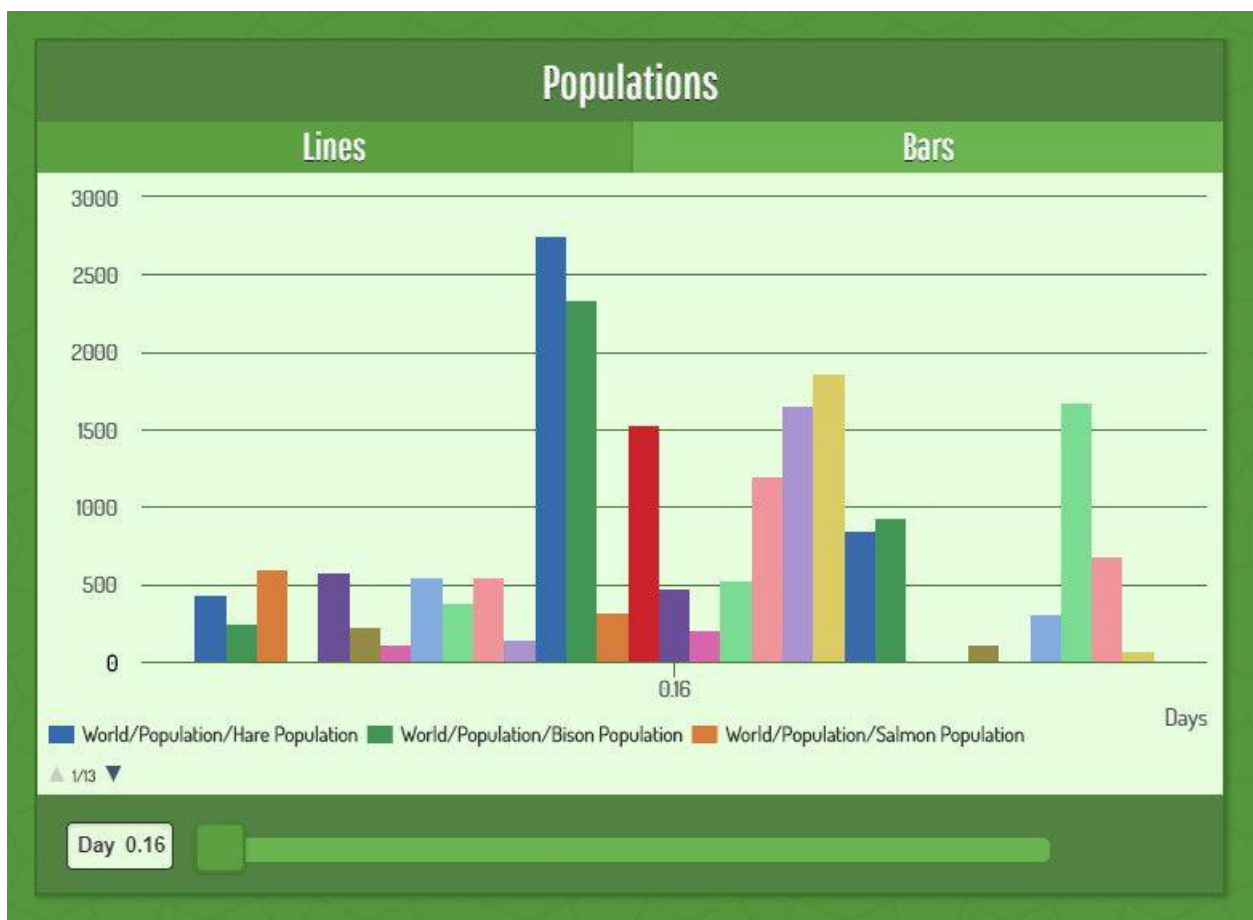
effective in drawing connections and influencing minds than anthropomorphic animals (Plante et al., 2018).

It is thus important that anthropomorphizing animals should ideally be avoided. A nonhuman should be respected based on their own merits and individuality rather than requiring a humanlike portrayal to gain that respect. It can seem tempting to create humanized animal characters who can walk, speak, and live like humans, in an attempt for higher relatability, but those characters are then effectively humans. Players may become emotionally attached to them, but are unlikely to connect them to real world animals. Any respect for nature thus fostered in the process will not be translated over from the game world. However, there are still cases such as *EcoQuest (1991)* where humanizing animals can actually serve to get a message across that might otherwise be harder to relay. If humanizing animals is the only reliable way of meeting the objectives of a prospective game, it is still a reasonable feature to include, but designers are ultimately encouraged to portray animals realistically as far as feasibility allows.

5.2.3 Eco

As an ecosystem simulator, *Eco* (2018) can be considered as an exceptional tool for teaching players about ecology and ecosystems, and there are a good number of learning points that can be carried forward to this thesis.

We have already covered the importance of making player actions impactful, noticeable, and relevant. The strong feedback in *Eco* (2018), especially when it comes to depicting pollution (Fjællingsdal & Klöckner, 2019) is evidence of this. *Eco* (2018) also features countless ecological models that make the often complex dynamics of ecosystems more approachable to a general audience.



(Figure 8 - Ecosystem Data)

(MobyGames, 2018 <https://www.mobygames.com/game/102908/eco/promo/group-35627/image-329469/>)

[As an ecosystem simulator, *Eco* (2018) comes armed with scientific data models, making it a tool to impart knowledge about ecology. In addition, these models cover a wide variety of information points, showing players how everything matters]

Player agency was also mentioned as a strong point in *Eco (2018)*, but the game has the capacity to push this even further. While players can play solo, the feature exists for multiple players to simultaneously work on one planet. When limited to solo play, players in *Eco (2018)* can destroy vegetation, hunt animals, mine minerals and construct infrastructure. In a multiplayer server however, players can also define rules, claim land, and communicate with one another to develop better strategies for dealing with the impending meteor. In some cases, this can even “simulate the Tragedy of the Commons” (Fjællingsdal & Klöckner, 2019), an ecological concept that is key to understanding human-nature relationships. The Tragedy of the Common refers to how resources eventually become depleted when multiple parties gain access to an otherwise unregulated area. This typically happens when one party increases their take and other parties move to reciprocate, creating an endless cycle that eventually overwhelms the area. This is the exact scenario observed in *Eco (2018)*, but players are forced to work to prevent a tragic outcome.

Werewolf the Apocalypse (2020) also showed how various parties are involved when dealing with environmental protection and how messy politics can be. Experiments conducted in the UK regarding climate change policies have shown that the most crucial element is successful communication between all concerned parties (Buck, Sturzaker & Mell, 2022). This makes collaboration and cooperation a valuable design tool that can be implemented in games with the capacity to do so. Interaction and communication can also prompt important discussions, engage thought processes and improve learning, making them effective in imparting respect for nature.



(Figure 9 - Proposing Laws)

(MobyGames, 2018 <https://www.mobygames.com/game/102908/eco/promo/group-35627/image-329470/>)

[*Eco* (2018), similarly to *Werewolf the Apocalypse* (2020), touches on environmental politics, but in a more personal way]

As shown by the ecological data provided in *Eco* (2018), realism can be a strong tool to use in the field of education, and realism is further supported by *Eco* (2018)'s food and time mechanics. Players in *Eco* (2018) must tend to their nutritional needs, a mechanic that is implemented by using calories and types of nutrients consumed. This is noteworthy in the sense that games throughout the industry often do not make any distinction between different types of foods. In *Battle Chef Brigade* (2017), there are mandatory ingredients for competitions and food elements, but where nutrition is concerned, all foods are identical. If games can accurately differentiate between foods, they have the potential to educate players about the strengths of vegetarian food, food which still holds negative perceptions in a significant number of human populations

(Bryant, 2019). Additionally, realism can have an impact on players by forcing them to feel the passage of time. For example, when trees can be chopped down quickly but take forever to grow, players may realize the fragility of nature and take care not to damage it. Just like how nutrition is often sidestepped, many games also sidestep this passage of time for the purpose of smoother gameplay. While this is understandable, enabling players to feel time, creation and destruction in a natural context will help educate them about the value and meaning of life.

Ultimately, *Eco (2018)* does a commendable job at promoting respect for nature and does so at a level most games are unable to reach. This makes *Eco (2018)* a good case study for developers wishing to foster respect for nature with their games. Making player actions genuinely impactful, forcing critical decision making, encouraging collaboration, realism, relatability and presenting a compelling motivation are the key takeaways here. *EcoQuest (1991)* and *Werewolf the Apocalypse (2020)*, in addition to several of these takeaways, also introduced the concepts of empathy, fear appeal and anthropomorphism that can all be valuable tools when implemented carefully. The field of learning in games continues to grow rapidly as games become popular classroom aides. Great potential thus lies in exploring how games can effectively teach players to adopt or consider a biocentric worldview.

5.3 Category - Exploration

Games in the exploration category typically feature the environment as an expansive 2D or 3D world where players have the freedom to wander and discover at their own pace. This often leads to learning, which may cause such games to appear similar to educational games. However, educational games are designed specifically to teach players about a certain topic and make that the main focus of their gameplay. To better illustrate the difference, we can consider the notion that all players who engage with an educational game will complete it having learned a fairly consistent amount of information. In contrast, players who engage with exploration games will only learn based on their individual interpretations of the interactions they have with the game world. The information gained at the end will thus vary greatly. For example, playing *EcoQuest (1991)* will generally leave all players with a better understanding of impacts to marine ecosystems. *Werewolf (2020)* will similarly impart knowledge about politics, and *Eco (2018)* about ecology. In comparison, a game like *Firewatch (2016)* will still provoke learning, but this may be different when simply following the main story path versus trying to navigate without aid or trying to look for wildlife or allocating more time to a particular area in the game.

Explorative games are important to consider because the immersion and relative freedom they provide allow for simulated experiences within a natural environment, which in turn may deepen respect for similar environments.

5.3.1 Firewatch

Firewatch (2016) is a game where you play as Henry, a man who accepts work as a ranger at a national park in Shoshone, Wyoming. Gameplay involves patrolling a vast nature reserve to scan for sources of fire, but also includes tackling emotional baggage and solving underlying mysteries.

From the game's context, nature is represented as a soothing or healing element, as Henry's wishes involve escaping from stresses and healing emotional wounds caused by urban life. Spending time being immersed in nature is largely understood to have restorative qualities (Shanahan et al., 2019), and may help strengthen human-nature connections (Ives et al., 2017) and this link is illustrated by *Firewatch (2016)*'s narrative and gameplay.

As *Firewatch (2016)* and similar games enable the player to engage with, learn about and form a greater bond with nature, we can conclude that they do attempt to foster respect for nature. They highlight the positive aspects of nature and help players appreciate that which cannot be experienced in an urban landscape. This is conveyed in *Firewatch (2016)* through audiovisual cues and is similarly conveyed in *Werewolf the Apocalypse (2020)*, but instead through textual description.



(Figure 10 - Idyllic Nature)

(Nintendo Life, 2018. <https://www.nintendolife.com/games/switch-eshop/firewatch/screenshots>)

[A scene from *Firewatch* (2016), showing a beautiful natural environment. Ties are made to the restorative powers of nature]

Furthermore, in contrast to exploitation, these games provide an immersion into nature without allowing for any form of interference. Essentially, players are unable to destroy, harm or remove any element of the natural environment, and can typically only interact with human objects and structures. Non-interference is one of the guiding principles of Taylor's definition of "respect for nature" (Taylor, 2014), and is important for games, especially those with an explorative focus, to include as part of their framework. *Firewatch* (2016) additionally entrusts players with the responsibility of protecting an environment from human activity such as starting fires or littering. This is an example of fostering empathy not for a single creature but rather for an entire ecosystem, similar to what was seen in *EcoQuest* (1991) and *Werewolf* (2020). Explorative games can thus be said to succeed at building empathy for nature, which should translate to respect and a desire for preservation.

Firewatch (2016) also presents the option of bleed, which is similar to empathy, but focuses on the protagonist as opposed to a third party. Bleed is a concept commonly utilized in Live-Action Role Playing Games that is designed to translate the feelings and motivations of a character onto the player. (Toft & Harrer, 2020). In that sense, if games thrust players into a role of protection rather than the more common role of destruction, there exists the opportunity to bleed responsibilities, fears, goals, and lifestyles of characters with a high respect of nature onto players. Players may then become aware of the actions of themselves and others in reality, and in turn improve their own relationship with and opinions of nature. Additionally, *Firewatch* (2016) introduces the option of procedural bleed, whereby the repetitive actions of players in the game develop muscle memory that translates to real life (Hugaas 2019). This is illustrated by players continually sighting and removing pieces of trash - a concept also observable in *EcoQuest* (1991) -, potentially developing reflexive memory that translates either to removing trash from real environments or abstinence from littering.

While *Firewatch* (2016) provides a good immersive experience, it does reveal a pitfall that is best avoided. The world in *Firewatch* (2016) is notably lacking in nonhumans, whom one would expect to find in strong numbers when exploring natural environments. This can lead to a world that feels lifeless or empty at times.



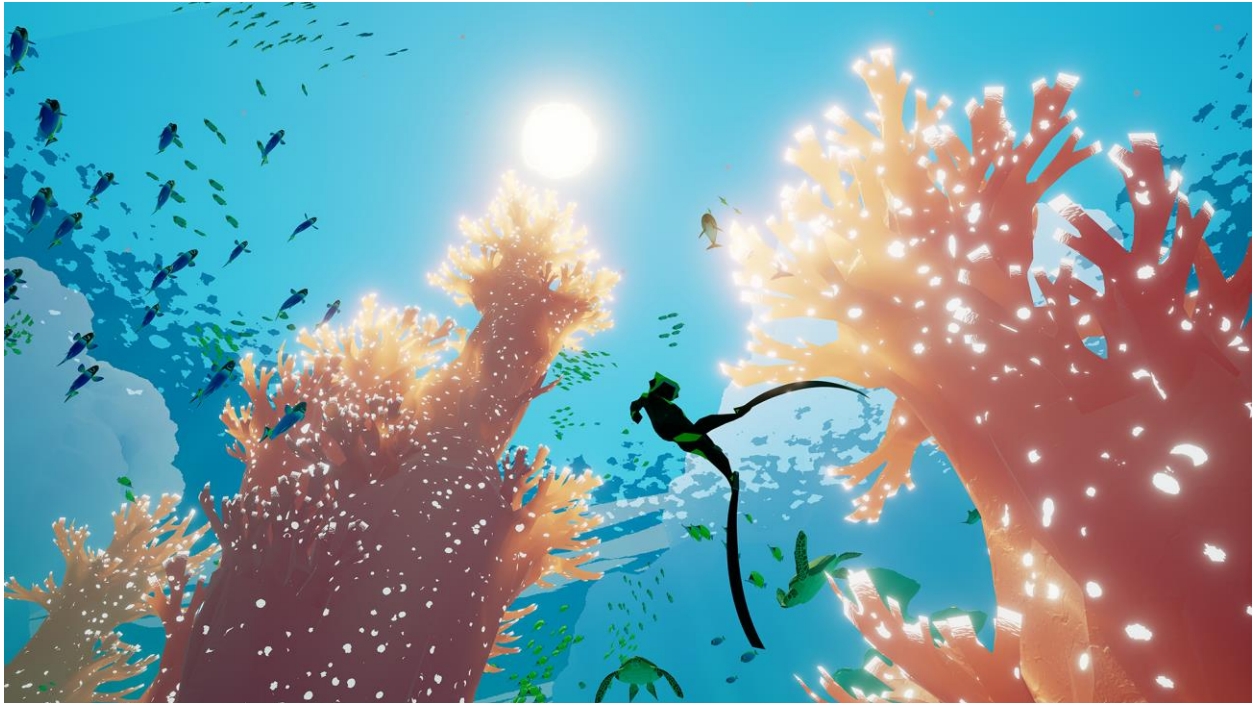
(Figure 11 - Scarce Fauna)

(Nintendo Life, 2018. <https://www.nintendolife.com/games/switch-eshop/firewatch/screenshots>)

[While there are a few animals in Firewatch (2016), there should be many more of them present, especially within a National Park. Games that wish to provide an immersive experience in a natural environment should strive to ensure that nonhumans exert a strong presence in the game.]

5.3.2 Abzû, Beyond Blue

A contrast to lifelessness can be seen in games like *Abzû* (2016) or *Beyond Blue* (2020). They include a strong cast of nonhuman actors and allow players to appreciate their natural behavior without being able to interact with them.



(Figure 12 - Lively Ecosystem)

(SteamDB, 2016 <https://steamdb.info/app/384190/screenshots/>)

[The marine worlds in *Abzû* (2016) are teeming with life, and provide infinite possibilities for exploration and discovery]

However, the example of releasing new species into the ocean (Bianchi, 2019) is a dangerous pitfall to avoid as games should not give the impression that ecosystems or certain species depend exclusively on humans for survival or existence. Readers may remember how *Crashlands* (2016) depicted a world centered around the protagonist. By contrast, in *Firewatch* (2016), or even in *Eco* (2018), the player is just another animal being inserted into an ecosystem, and thus the world is centered around that ecosystem instead of the player. The latter is what should be strived for. *Abzû* (2016)'s gameplay darts between both views and this may conflict with the goal of improving respect. In the case of *Beyond Blue* (2020), the interaction is more muted and involves the addition of scientific equipment for the purpose of research. We have established that learning is ultimately the first step in building respect. Thus, despite the obvious interference involved, being thrust into the role of a scientist or researcher is still a valid option that games can pursue, as it allows for learning, immersion, and bleed to take place.

5.3.3 Ty the Tasmanian Tiger

Being a game where environments are obstacles to overcome, *Ty the Tasmanian Tiger (2016)* more readily belongs to the category of domination, but it makes an important argument relevant to exploration which cannot be ignored.

Firewatch (2016) features an American National Park. The similar game *Kona (2017)* features a Canadian National Park. *Abzû (2016)* features realistic marine ecosystems. Similarly, *Ty (2016)* features Australia. The point here is that the choice of environment matters.

Australia is a megadiverse environment with many endemic species that is also unfortunately facing severe human-induced threats such as coral reef bleaching, increased fire probability and invasive introduced species (Martin et al, 2020). This makes renderings of the country in video games more important as it raises the chance for increased awareness and support. Other megadiverse countries such as Brazil, China, India, Philippines, Madagascar, or South Africa, just to list six of the seventeen, are recommended targets for visualization in games. Iconic or vulnerable locales such as polar regions, underwater ecosystems as seen in *Abzû (2016)*, or even mountain ranges as partially seen in *Insurmountable (2021)* also give rise to similar possibilities.

In *Ty (2016)*, the music, sounds, language, characters, flora, fauna, mechanics, and world design all come together to give a very strong impression of Australia, even if it may benefit from increased realism. Playing *Ty (2016)* thus arguably facilitates the development of fondness for Australia, encouraging players to learn more about it, become interested in it and wish to visit it. In extreme cases, it may even will players into pondering the preservation of the unique habitats that exist there, or at least deem them important enough to worry about their disappearance. This is ultimately mere speculation as it is biased from my personal viewpoint, but the possibility exists nonetheless. The more realistically and lovingly a particular ecosystem is depicted, the greater the chance that players can build a connection to its real-world counterpart. In turn, that raises the chance that they learn to appreciate nature and recognize the importance of not destroying it.



(Figure 13 - Australian Biomes)

(Personal Screenshots)

[Ty the Tasmanian Tiger 1 (2016) features a good variety of biomes. Seen here are a billabong, a mountain, a coral reef, and rainforest. Doing the same, but with increased realism and biodiversity, can have an impact.]

Looking at games like *Assassin's Creed (2008)* that feature a historical world, or games like *Yooka-Laylee (2017)* that feature a fictional world, the environments depicted may not matter to the goal of fostering respect for nature when compared to environments which are real and modern. This boils down to whether connections can be made between the in-game environment and real life, tying back to the point about realism being optimal for education. Similarly, realism can be optimal when concerning exploration.

There is an endless list of games that can be mentioned, but ultimately, explorative games attempt to build empathy towards a natural ecosystem by immersing players within it and allowing them to experience the environment without being able to directly manipulate it, thereby preserving the rule of noninterference proposed by Taylor (2014). Games may benefit from featuring protagonists with protective or scientific roles as their feelings of responsibility and commitment, as well as their actions, can bleed onto players. Games should be careful not to include any significant instances of interference that can encourage false human-nature relationships. Games would also benefit from the accuracy, realism, and richness of their depictions.

5.4 Category - Domination

The concept of Domination builds on the idea of Exploration but differs in the execution. Where exploration games make traversal of the environment a more relaxed and free activity, games in this category instead make traversal a challenge, tasking the player with overcoming all the different elements present in the environment. *Ty (2016)* has already been mentioned as having an environment which is an obstacle to overcome. This differs from an exploration game such as *Firewatch (2016)* where the environment offers little resistance to the player and the player in turn does not disturb the environment or any of its inhabitants.

Domination also has ties to the human ideal of conquering the environment or being masters of nature. This can be seen in examples such as *Minecraft (2011)* or *Dragon Quest Builders 2 (DQB2) (2019)* whereby the environment is there for the player to sculpt as they see fit. It can also be seen in the case of *Insurmountable (2021)* where humans attempt to brave extreme environments which they are not meant to tread.

Considering that Domination involves a potentially hazardous human-nature relationship where humans exert their will on the environment, discussing games in this category is relevant in examining how popular godlike mechanics such as those seen in *DQB2 (2019)* can be crafted to foster respect for nature.

5.4.1 Insurmountable

All six categories rely on learning to some extent, which may make a mountain climbing game like *Insurmountable (2021)* seem like an educational game. At first glance, it appears to elucidate a complex world, similar to *Werewolf the Apocalypse (2020)*, which made environmental politics approachable for players.

However, *Insurmountable (2021)* does not have education as the focus of its gameplay, as most of its concepts and mechanics are heavily simplified from their real-world counterparts. *Insurmountable (2021)* is also not an exploration game as the environment clearly stands as an obstacle, and opportunities for discovery are nonexistent.

The most pertinent aspect of *Insurmountable (2021)* is the fact that it offers an alternate definition of “respect for nature”. Games may thus force “respect for nature” by imperiling the player, and threatening their personal safety should they fail to respect their surroundings. This is important because failing to respect nature in the real world often has consequences which manifest slowly and are not readily felt by an individual human, instead spread out across entire

species and biomes. In the case of *Insurmountable* (2021), these consequences are strong and personal as they have a direct and powerful impact on the individual.



(Figure 14 - *Insurmountable* (2021))

(Personal Screenshot)

[Failing to respect nature can only end in tragedy, especially when it strikes hard at the individual player and has a more powerful impact than if it were to affect humans as a whole]

It is however crucial that this be done without allowing the option to modify the environment, as is seen in *Insurmountable* (2021), where none of the rocks, ice blocks, snow or caves can be removed, moved, or disturbed beyond simply serving as a temporary climbing, walking, or camping space. Any equipment used by the player is also not visually left behind.

The mountainous world in *Insurmountable* (2021) gives rise to a potential design consideration that can be implemented in future games. Curiously, this involves further emphasizing the concept of domination. As visible in Figure 15 below, increased activity in Mt. Everest has led to significant pollution (Napper et al., 2020) and other detrimental effects to the surrounding ecosystem such as deforestation and littering (Pallathadka, 2020). Building on the aforementioned idea of representing megadiverse ecosystems, games can be designed to realistically depict extreme environments such as mountain ranges, deserts and ocean depths, crucially including the pollution contained within. If players must strive to dominate these environments, only to be confronted with the reality of human impacts even amidst such extremity, this will impart on them a lasting impact. This impact can be further enhanced with

the inclusion of nonhumans and the effects felt by them. Doing this will admittedly emphasize human superiority, but subsequently bring it crashing back down as the realization hits.



(Figure 15 - Everest Trash)

(IndiaTV, 2019 <https://www.indiatvnews.com/news/india-garbage-collected-from-mt-everest-522918>)

However, it does not negate the possibility that players will nonetheless strengthen their feelings of superiority over nature or perhaps view nature as a dangerous entity in need of taming. Showing adverse human impacts in these hostile environments and how those impacts affect nonhumans are ways in which this can be mitigated, as is noninterference, but there are other strategies that can be attempted. For example, based on learning points gleaned from exploration games, even if human impacts are absent, a strong inclusion of observable but non-interactable flora and fauna or emphasis placed on beauty and nature's restorative qualities can inculcate appreciation or empathy to counter superiority or danger. Additionally, narratives and mechanics can employ bleed as was done in *Firewatch* (2016) and *EcoQuest* (1991).

5.4.2 Ty the Tasmanian Tiger

The largest representation of domination in the games industry comes from open world platformer games, including titles such as *Yooka-Laylee* (2017), *Jak and Daxter* (2001), *Prince of Persia* (2008), *Assassin's Creed* (2008), or indeed *Ty* (2016), which was mentioned earlier as being particularly important due to its choice of environment. While that is relevant to the topic of exploration, we have yet to examine how the domination mechanics in this genre influence respect for nature.

Said mechanics ultimately pit the player against the environment, whether it involves traversal, platforming, parkour, manipulation, or combat. It may already be apparent that domination mechanics do not agree with respect for nature, as enemies - often local inhabitants - must be defeated and aspects of the environment must sometimes be changed to enable further progress. In *Ty* (2016), this can be illustrated by the inclusion of enemies such as spiders, leeches, cockroaches, crustaceans, crocs, and sharks, all of whom are understood to be Australian natives and rightful centers of life. Yet, other species such as wallabies, cranes, frogs, and small fish are docile and flee as *Ty* (2016) approaches. While the topic of speciesism will be addressed in the relevant Nonhumans category, one design option to consider when implementing combat is to allow the option of nonviolence. For example, most of the enemies in *Ty* (2016) are weak compared to the protagonist and can usually be ignored.

In *Ty* (2016), there are countless manmade objects scattered around the different biomes such as floating platforms, levers, fences, and buttons. It may thus be of merit to ensure that all obstacles and platforming implements are of natural origin and part of the underlying environment. Failing to do so may support the impression that human influence exists even in the remote wilderness, which only serves to highlight human domination over nature. However, as discussed with *Insurmountable* (2021), this may also be a useful strategy if implemented correctly. Of greater certainty though is the fact that modifying the environment should either be avoided or be designed as the toughest challenges and should never be trivialized. Doing so is crucial to remind players to respect the foreign world they have entered.

5.4.3 Dragon Quest Builders 2 (DQB2)

DQB2 (2019) can be considered as a textbook example of domination over nature in the games industry. Its mechanics involve tearing blocks from the environment, construction, harvesting and hunting. This is similar to *Eco (2018)*, but the construction in *DQB2 (2019)* is characterized by significantly higher freedom and its mechanics lack the same level of complexity.

The immediate issue with *DQB2 (2019)* is the same impression of humans being masters of nature that was mentioned in the earlier examples. With the ability to remove any chunk of nature and move chunks around, it would appear that nature exists as a human plaything, which in turn is a dangerous way of thinking about human-nature relationships. It would be easy to recommend a similar game to ensure that all player actions have a noticeable impact like in *Eco (2018)*, but failing that, what other options are available? *DQB2 (2019)* gives one novel idea that can be considered. That idea is to create a sense of intrusion, and let player agency do the rest.

Although this may be personal bias, while playing *DQB2 (2019)*, there always seems to be the sense that I as the player am intruding into territory that does not belong to me. There can be many reasons for this. There are pre-established towns that serve as bases, and hence remind the player that they are a foreigner and should be aware of their actions. Native monsters are readily visible on the map and mind their own business, again creating the sensation of a foreign protagonist. The game's narrative is about creation and destruction, which imbues a certain sense of responsibility. It helps that tedium exists, with both creation and destruction taking time and requiring effort. Although this will be discussed further later, there is also little human superiority in the game as monsters are designed with similar individuality. Regardless, it is something that domination-themed games should strive for. If they can successfully make the player feel like an outsider and subconsciously discourage antagonistic behavior, they can spur relevant thoughts on the matter and help improve respect for nature.

As minor as it may seem, the most significant aspect of *DQB2 (2019)* is that there are some items which cannot be manually created, such as stalagmites, mushrooms, berries, rocks, and cacti. The inclusion of such items in a game about domination is crucial because they remind the player that humans can never fully dominate nature. Some parts of nature, when destroyed or manipulated, are lost forever. The importance of this lesson can never be stressed enough, and games would do well to include this teaching as part of their gameplay.



(Figure 16 - Non-craftable Stalagmite)

(Personal Screenshot)

[There are many decorative items in DQB2 (2019) that cannot be manually crafted. If the player were to destroy them, they are lost forever.]

Domination is ultimately similar to Exploration as it relies on similar mechanics whilst adding an extra layer of action, whether it may be combat, environmental hazards or traversal. While domination is by definition, human domination over nature, games can instead be designed to highlight the exact opposite, showcasing how nature maintains dominion over humans and how humans must respect nature as a result. This can often be accomplished by imperiling players or including aspects of nature in their gameplay that can never be fully controlled. Similar to exploration games, domination games can also benefit from realism, accurate depiction of human impacts, and noticeable consequences of player actions. Creating a sense of foreignness directed at the protagonist, though difficult to accomplish, can also go a long way. Level design options such as the crafting of obstacles to be part of the environment is another approach to take.

The discussions so far have focused largely on the environment as a whole and explored various ways in which they are portrayed or used in games. However, as mentioned earlier, having respect for nature can be broken down into respect for the environment and respect for nonhumans. It is thus imperative to now focus on how nonhumans are featured in games and explains why two categories were added to the four proposed by Abraham & Jayemanne (2017). The two categories, Nonhumans and Interspecies Relationships, will be discussed together rather than separately as both are heavily interdependent and cannot exist without the other.

5.5 Categories - Nonhumans and Interspecies Relationships

There are several ways in which nonhumans are commonly framed in video games. They can range from realistic animals to fictitious monsters, or anything in between. They may be friendly, neutral, or hostile, and range from being anthropomorphic to being no different from items. Regardless of how they are framed however, they undoubtedly form an integral component of a large variety of games ranging across many genres. This is readily apparent when considering all the games already discussed thus far, as many of them indeed feature nonhumans. Treating individuals of all species as equals, both in terms of superiority and importance forms the foundation of a respect for nature, and reviewing games which heavily feature nonhumans should be a key focus of this analysis. Additionally, games with nonhumans also inevitably express diverse interspecies relationships that arise between the various in-game species or creature groups. These relationships can present interesting models to study when learning what to adopt or avoid in future game design.

5.5.1 Monster Hunter Stories 2: Wings of Ruin (MHST2)

There are a number of issues pertinent to the discussion of nonhumans which can be addressed, and *Crashlands* (2016) has already served to illustrate the strongest of these issues: the adoption of an anthropocentric worldview. Truthfully, an anthropocentric worldview can be observed with a worryingly large quantity of AAA and even indie games, regardless of whether they have an environmental focus or not. This drives the necessity to examine normal, popular games which are consumed by a wide audience and hence, games that can have a potentially powerful influence on a sizable portion of the player base. The *Monster Hunter* (2004 - 2022) franchise is a good representative of the AAA brand as it is an excellent reflection of an anthropocentric society and reinforces common antagonistic notions such as human superiority and dominance over nature, as well as being popular and highly rated.

MHST2 (2021) is, at its heart, a game about hunting enormous monsters, although their movement and appearance may allude to ‘dinosaurs’ being a more appropriate term. This is important to note because monsters are sometimes so heavily distanced from modern animals that the connection between the two may no longer be made by players. A simple example of this is illustrated by Figure 17 where the supernatural demons of *Black Book* (2021) can be contrasted against *MHST2* (2021)’s dinosaurs. The more realistic the monster designs are, the easier it is to form a connection between in-game fantasy and reality, allowing thoughts or impressions for both to be interchangeable. This was additionally mentioned earlier when *EcoQuest* (1991) introduced the issue of anthropomorphism.



(Figure 17 - *Black Book* (2021) vs *MHST2* (2021))

[Left - *Black Book* (2021)]

(Steam, 2021. Cropped Image)

https://store.steampowered.com/app/1138660/Black_Book/

[Right – *MHST2* (2021)]

(Monster Hunter Wiki, 2022)

https://monsterhunter.fandom.com/wiki/Velociprey_Photo_Gallery

At first glance, based on Figure 18, *MHST2* (2021) appears to highlight strong interspecies relationships and human empathic ability by rendering a world rich with biodiversity and settlements where monsters live alongside humans. When delving deeper however, the anthropocentric design of the world comes to light.

Firstly, the relationships between humans and monsters can be discounted based on how monsters are inducted into human society. Eggs are poached from monster dens after outlawing and killing protective mothers, and then hatched in the company of happy human faces. Dinosaurs are prone to visually imprint on objects or lifeforms at a young age, and this will have significant influences on their development, behavior, and perception of other creatures (McCabe, 2019). This is a classic example of how vulnerable minds can be deceived and taken advantage of, which is a mechanism that Taylor (2014) strongly advocates against, thus reflecting a poor respect for nature. Healthy interspecies relationships are certainly important and should be encouraged as they may contribute to increased mutual respect (Haraway, 2013), but these relationships are only meaningful when they develop in a natural and mutually beneficial manner free of deception and exploitation. Games must thus exercise caution when designing these relationships, especially considering how prevalent false relationships are. For example, poaching and deception are similarly observed in *Crashlands* (2016).



(Figure 18 - Coexistence or Deception?)

(Personal Screenshot)

[Having healthy interspecies relationships in a rich environment can send the wrong message as it is built on an exploitative foundation]

Secondly, narratives in *MHST2 (2021)* paint humans as shepherds of nature, assuming the responsibility to repair ecological imbalances caused by monsters. This creates a false human-nature relationship which implies that ecosystems naturally fall into disrepair and then require human intervention. On the contrary, based on resilience theory, disturbed ecosystems are capable of returning to their original state without intervention (Dudney et al., 2018)

Additionally, practically all modern environmental disturbances can be attributed to human activity, which has had a significantly global reach sufficient to define the Anthropocene as the present era (Lewis & Maslin, 2015). With this in mind, ecological stewardship should ideally be avoided, unless being used to directly counter artificial or human-induced impacts.



(Figure 19 - *Shepherds of Nature*)

(*Personal Screenshot*)

[*Humans always know what's best for the ecosystem*]

Third is a distinct lack of realistic monster behavior in *MHST2* (2021). While herbivores are typically nonaggressive, carnivores will almost always attack, even when the player is riding on a gigantic monster whom the tiny attackers have no hope of taking down. Implementing such behavior leads to players wrongly seeing other monsters as the aggressors and in turn, justifying their retaliatory actions, which happens even while poaching from dens. In reality, even most carnivores will flee from human presence and will not recklessly attack. Countless games feature overworld encounters, and the design of overworld monsters is extremely vital. It may be unavoidable that some monsters must display aggressive behavior, but as mentioned with *DQB2* (2019), this can be mitigated by making the player feel like the intruder or aggressor, seeing as they are trespassing into the monster's territory. Narratives and language should stress this fact, instead of the scenes in *MHST2* (2021) that exclusively label monsters as the aggressors, thereby echoing anthropocentric design.



(Figure 20 - Unrealistic Aggression)

(Personal Screenshot)

[It doesn't seem reasonable for predators to aggressively attack two humans riding much larger monsters]

Lastly, *MHST2 (2021)* can introduce the concept of speciesism, which was briefly mentioned regarding enemy design in *Ty (2016)*. Speciesism can partly be attributed to the concept of monstrosity, whereby monsters are designed in games to reflect human fears, dislikes and unknowns (May, 2021). This leads to anthropocentric design where enemies are often creatures perceived by humans as dangerous or undesirable. The spiders, leeches, sharks, and crocodiles in *Ty (2016)* allude to this fact. In *Monster Hunter (2021)*, we can notice that cats, perceived positively by humans, are given elevated status and anthropomorphized, even assuming critical roles in human settlements. The problem with speciesism is that it assigns value to species based on anthropocentric perceptions rather than biocentric perceptions, normalizes discrimination and reaffirms the human-nonhuman divide, all of which are in opposition to the concept of treating all life equally. Games would therefore benefit from discouraging speciesism.

Ultimately, what *MHST2 (2021)* does is portray and casually normalize a world where humans are superior to all other species and where nonhumans are either slaves, tools, resources, vermin, or experience, eroding their individuality, and justifying antagonistic behavior towards them. Anthropocentrism is further conveyed through narratives of stewardship and misdirected aggression. Even though we have already seen several examples where games aim to promote respect for nature, they are unfortunately in the minority. There is thus ultimately the concern that games like *MHST2 (2021)* will end up having louder voices, especially as they more

accurately mirror real human-nature relationships. It is thus crucially vital for future games to give individuality and agency to all the people they choose to represent, no matter whether they are humans, nonhumans, or other kinds of lifeforms entirely.

5.5.2 Pokémon

The popular mechanic of creature collection, where nonhumans are treated as possessions or items and acquired by players for various reasons, has already been seen in the form of poaching. One of the most prominent examples of creature collection however, would be the *Pokémon (1996 - 2023)* franchise. Curiously, there seem to be significant differences between the mainstream games, spinoffs² and crucially the anime, necessitating its inclusion in this analysis.

With the *Pokémon (1996 - 2023)* mainline games, nature is largely disrespected. Humans abduct Pokémon from the wild, fainting countless others, with seemingly zero consequences shown. With them respawning endlessly in good health, *Pokémon (1996 - 2023)* echoes the hallmarks of exploitation already seen earlier. Taking mainline *Pokémon (1996 - 2023)* games at face value, the result is an anthropocentric world where nonhumans are inferior to humans, their roles confined to disposable objects or collectibles, existing only for the purpose of human use. Breeding mechanics in *Pokémon (1996 - 2023)* further stand as counters to ecology, seeing as a Pokémon pair can endlessly produce eggs, which can be hatched and released without consequence. Pokémon are also lauded for anthropocentric competitive value or alternate colors, rather than for personalities which are never modeled or shown. In that sense, two Pokémon with the same stats, color and moves are effectively identical clones in the eyes of humans. All these observations lead to the conclusion that Pokémon in mainline games lack individuality and agency, and that players of these games may carry this disrespect of Pokémon over to real world animals³.

On the contrary, the *Pokémon (1996 - 2023)* anime has a long-standing reputation of being themed around nature, exploring narratives that relate to interspecies relationships, environmental protection, symbiosis, and ethics (Bainbridge, 2014). The very action of treating Pokémon as items and tools is demonized, and ecological disturbances are almost exclusively caused by humans or human-controlled Pokémon, which contrasts the narratives already seen in *Monster Hunter (2021)*. Human intervention is instigated only to counter human activity rather than nonhuman activity. Furthermore, Pokémon are largely shown as having unique and individual lives, and are clearly animals who belong to a larger ecosystem. They have their own goals, desires, likes, dislikes, and personalities that are not defined by their species. Pokémon in the anime even tend to join trainers willingly, and there are real interspecies bonds to be found that have not arisen as a result of coercion. We may only posit as to the reason why these

principles from the anime could not be translated over to the mainline games, but nonetheless displays design considerations that games with nonhuman parties can employ.

Although introduced by an anime, illustrations of these design principles can be seen in video games. For example, nonhuman individuality and agency is present in *DQB2* (2019), where monsters have individual traits that don't always align with their species, and in *Dragon Quest Monsters* (2006) where monsters join players willingly if they are impressed with the strength of the player party. This contrasts the forceful capture seen in *Pokémon* (1996 - 2023) mainline games. An inspiration of Pokémon leaving trainers can be gathered from *Gloomhaven* (2021), where characters have their own inventories, funds, goals, challenges, and leave the party once satisfied. Similarly, Pokémon may aim to reach levels, learn moves, evolve, beat gyms, or conquer the league and possibly choose to leave thereafter. On that note, it makes sense that Pokémon or nonhumans are treated as party members rather than as possessions. This can be, for example, seen in *Digimon* (2019).

As for design principles from *Pokémon* (1996 - 2023) video games, a case can be made for overworld encounters over random encounters, even though a critical example was mentioned with *MHST2* (2021). When comparing *Pokémon Scarlet* (2022) with *Pokémon Black 2* (2012) for example, the former allows Pokémon to display vivid signs of life, natural behaviors, and interspecies interactions, making them closer to living things than nonliving things. In the latter however, the opposite is true as this display of life becomes hidden. To support this further, *DQB2* (2019) accomplishes a sense of intrusion partially because its monsters are visible on the overworld.



(Figure 21 - Random Encounters vs Overworld Pokémon)

[Left - *Pokémon Black 2* (2012)]

(Tech Gaming, 2012 <https://www.tech-gaming.com/pokemon-black-2pokemon-white-2-review/>)

[Right - *Pokémon Scarlet* (2022)]

(Personal Screenshot)

[There is a notable difference between Pokémon who suddenly appear in a world where mostly only humans are visible versus a world where Pokémon are readily visible and display natural

behavior. The latter example more strongly conveys intrusion whereas the former conveys dominance]

Players of *Pokémon* (1996 - 2023) games may deem endlessly battling wild Pokémon justifiable because Pokémon are “fainted” rather than “killed”. Elucidating nonhuman fates may thus help in encouraging respect for nonhumans as these terms can have different ramifications in the minds of players. Alternatively, health can simply be prevented from reaching zero, triggering either an automatic flee or choice to kill or spare thereafter. Games may also opt to show opposing nonhumans making this same choice, as players never die when losing a battle.

Pronoun use in games is additionally an area for concern. Almost all Pokémon in every video game have a gender symbol next to their names, thereby logically following that ‘he’ and ‘she’ be used. Yet, Pokémon are always referred to with the discriminatory ‘it’ pronoun. It was shown how *Monster Hunter* (2021) eroded nonhuman agency and individuality in various ways, but this can similarly and effortlessly happen to Pokémon or animals when they are referred to as ‘it’.

If anthropocentric design is an issue in both *Pokémon* (1996 - 2023) and *MHST2* (2021), it then begs the possibility of leaving humans out of the picture entirely. Such a “nonhuman world” can be seen in *Pokémon Mystery Dungeon* (2020). Games with nonhuman worlds are relatively common in the industry, and include titles such as *Backbone* (2021), *Aviary Attorney* (2015) or *Chicken Police* (2020). Characters in these games are anthropomorphic animals, often birds or mammals. This returns to the previous discussion of anthropomorphism, which should ideally be avoided as it may undermine relatability to the real world.

Additionally, including humans in a game designed to influence respect for nature should be important because humans remain a major part of this planet and their actions have major impacts and consequences that should not be ignored in favor of nonhuman worlds. Any desired impacts and influences would thus likely be stronger when humans are also a part of the game world. However, this is not to say that there is zero potential with nonhuman worlds. Games where animal characters and protagonists are more realistically depicted, may still have a notable impact on players, as it increases the likelihood that they make connections to the real world. For instance, a game with only Pokémon can perhaps demonstrate first-hand to players that Pokémon are individuals with lives that matter. It can also showcase interspecies relationships that are otherwise difficult to observe from a human perspective, which may then foster appreciation and respect. Examples of this exist in the *Pokémon* (1996 - 2023) anime, but are unfortunately lacking in video games such as *Mystery Dungeon* where Pokémon live like humans, thereby leading to anthropomorphization and a weakening of any connections players may make.

5.5.3 Farms and Zoos

Nonhuman agency and individuality has been discussed at length and has been shown to be eroded by video games in various ways. Another key avenue by which this occurs is animal agriculture, the mechanics of which are common in video games. Modern animal agriculture, primarily the factory farm industry, is a major threat to environmental health and promotes discrimination.



(Figure 22 - Chickens: Living Beings or Food?)

(Personal Screenshot)

[Chickens in Slime Rancher (2017) are literally labeled as 'meat' and designed to look obese. Exposure to such imagery may result in the dehumanization of chickens. For example, the word 'chicken' meaning animal and 'chicken' meaning meat become interchangeable]

A frightening example of this is *Slime Rancher (2017)*, which encourages discrimination of chickens and potentially normalizes factory farms. Slimes, twenty at a time, can be cramped into pens barely large enough for one. Furthermore, slimes have a permanent smile plastered onto their face, indicating their acceptance of captivity. Even though slimes may not be relatable to real animals, the resemblance to factory farming cannot be ignored, and clearly shows what should be avoided in future games. More than just speciesism, games must work to allay dehumanization, which not only robs nonhumans of individuality and agency but also life itself.



(Figure 23 - Ghetto)

(Personal Screenshot)

[I would not be happy in such a situation]

As another example, we may turn to *Stardew Valley* (2016), a farming RPG which features monsters alongside animals, and makes very clear distinctions between 5 groups of creatures. These 5 groups are fish, monsters, animals, pets, and humans. Fish are completely dehumanized, classified as items. Monsters are demonized, existing to be hated and/or hunted. Animals are commodified, existing primarily to serve humans and translatable into goods or money. Pets are cherished and given elevated status, despite being biologically similar to other creatures. From *Stardew Valley* (2016), we can discern an anthropocentric hierarchy that classifies living beings based on their species. This hierarchy mirrors human society with fish at the bottom, “unfriendly” species, exploitable species, “friendly” species, and humans at the top. Natural ecosystems have a horizontal web as opposed to a vertical hierarchy as they depend equally on all their members. To thus assign a hierarchy that has value and meaning only to one species on the planet is clearly indicative of a poor respect for nature. Designing mechanics which discredit or challenge this hierarchy may thus have potential.

As a positive note however, animals in *Stardew Valley* (2016) cannot be killed, even if they can be sold. They also have needs which must be met in order for them to provide resources in turn, creating some semblance of a give-and-take relationship. This is perhaps one way in which farm games can help to foster respect for nature; by assigning intrinsic value to the lives of farm animals. I would additionally argue that games should ensure no animal can be translated into money, as items and living beings should not be comparable. Economic progress and nature are

also largely in conflict with one another, and life should always maintain importance and value over money (Juniper, 2013)

Being translatable to money is, however, a far more serious issue than one might realize. A painful example would be African game safaris where price tags are assigned to animals and money directly destroys natural ecosystems. In the case of zoo simulators like *Zoo Tycoon* (2001) or *Jurassic World Evolution* (2018), animals can be purchased with money, implying that nonhumans can be owned by humans. However, as clearly stated in the theoretical framework, ownership of another living being is in conflict with the definition of respecting nature, and hence games should try to avoid normalizing this relationship. This harkens back to pets in *MHST2* (2021) and even Pokémon themselves as the relationship there is that of ownership.

Zoo simulators, however, also offer complete freedom. For example, in both *Zoo Tycoon* (2001) and *Jurassic World Evolution* (2018), players may cage humans and let animals run free. Many actions possible with nonhumans are also possible with humans. Animals indeed have needs, but so do humans. Essentially, there is little distinction between humans and nonhumans, and this is something games can strive for.

5.5.4 Maneater

The possibility of switching roles between humans and nonhumans in zoo simulators presents a new design option to consider. What if games reversed the relationships between humans and nonhumans, either partially or fully?

Maneater (2021) is a game that at first glance seems to challenge the norm. It puts players in the fins of a shark who broke free from human captivity and assigns them the simple task of revenge.

Maneater (2021) presents an accurate depiction of sharks as a victim of human activity instead of the more conventional depiction of them as mindless killers. The protagonist is, after all, seeking revenge for being wronged. The main enemies in the game are also not civilians but rather hunters and fishermen. I have often pondered the merit of gameplay that involves animal protagonists fighting against humans, and this may be an acceptable mode of implementation.

Such a game may however defeat its own purpose, and solidify the impression that sharks are mindless killing machines, especially in players not willing to pay attention to context. This is further compounded by the fact that players have the option to slaughter civilians as much as desired, even if their targets are hunters, and will consume more fishes than expected in reality.

Nonetheless, potential remains in such an implementation, so long as it clearly emphasizes the messages it is trying to convey, which in the case of *Maneater (2021)*, could be that sharks, and many other misunderstood nonhumans, are abused and ostracized, and thus are sorely deserving of respect⁵.

5.5.5 Orwell's Animal Farm

Orwell's Animal Farm (2020) is a game based on a provocative book of the same title. The game is a short visual novel where the player oversees the story of Animal Farm over 7 in-game years. Players make choices about who responds to various scenarios that occur.

The main point in *Orwell's Animal Farm (2020)* is that it includes humans despite containing anthropomorphic animals, and imbues its humans with the awareness of nonhumans speaking English. This gives the opportunity to have conversations between the two that may harken to real relationships in farms, and thus reveal cruel hardships and discuss pertinent topics such as mortality, living space, environmental impacts, and abuse.

The game still has its speciesism, but is ultimately a satirism and thus unlikely to influence respect for nonhumans, especially considering that it is a satirism about authoritarianism rather than farming. Regardless, such games may possess the power to provoke thoughts and make players ponder, think and question, which may prove useful in sparking discussions around sensitive topics such as animal ethics.

5.5.6 Mutazione

We have so far seen largely negative relationships between humans and nonhumans, but there are two examples where beneficial interspecies relationships can be found. *Mutazione (2019)* is a narrative game based in a secluded environment that once used to be a regular urban space but was decimated by a nuclear meteor, triggering mutations in the local residents who managed to survive.

Although the residents seem to be of various species, we are not necessarily concerned with the interspecies relationships between residents as that is merely akin to human drama. Instead, we are concerned with the interspecies relationships between residents and plants.

For instance, the main settlement makes no effort to displace the natural landscape that once existed there, being constructed onto trees, and largely lacking in artificial pavements. Rich vegetation can also be seen growing throughout town, further emphasizing the health of the

ecosystem. Additionally, just outside the town lies a vast wilderness area that is home to a wide variety of plants and animals whose behavior is realistic as most of them flee from the protagonist as she walks through the wilderness areas. Although cities generally have trees and parks, games could go further to design urban spaces rich in both flora and fauna - ideally without uprooting the natural habitat that once existed - as a way to explore worlds where healthy relationships have developed between humans and nonhumans.

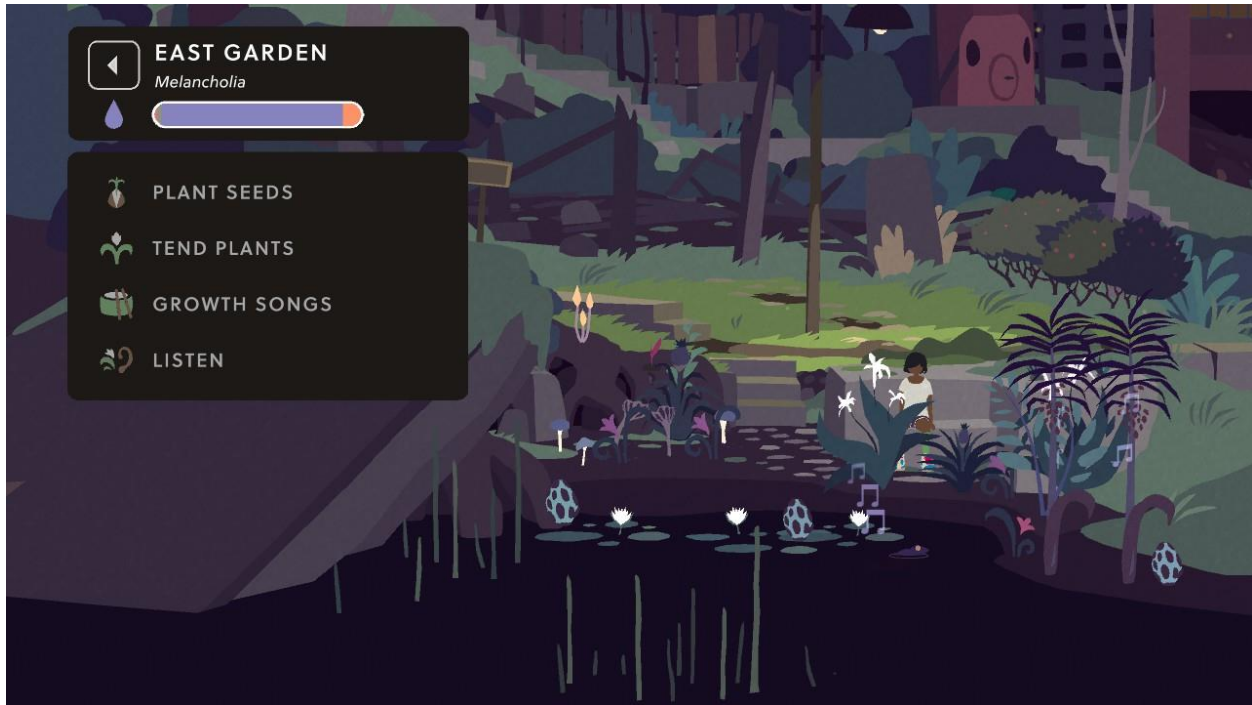


(Figure 24 - A Town Rich in Nature)

(Personal Screenshot)

[The town in Mutazione (2019) is rich in life and is interwoven beautifully with the natural environment]

Additionally, there are also several gardens where plants can be grown. Seeds are acquired by harvesting them from plants, but players crucially only collect seeds and not the plants themselves. In this way, the players are not removing plants from the environment but are instead helping them to propagate much like animals do with plants in reality. This stands in contrast to exploitative mechanics which simply have plants disappear entirely from the game once harvested. Taking seeds and planting them is akin to a mutually beneficial relationship between equal parties where you help plants in exchange for their resources, and is thus a clear example of respecting nature.



(Figure 25 - Gardening)

(Personal Screenshot)

[Gardening is a core mechanic in *Mutazione* (2019). Players are tasked with harvesting seeds from plants and can then grow them in several plots located throughout the town. The mature plants then introduce various benefits to all other people in the game]

Mutazione (2019) also vividly stresses the importance of nature to health and happiness which was addressed earlier by *Firewatch* (2016) and other exploration games. Plants are shown to cure illnesses, heighten moods and promote general well-being. Making this link is a good way for players to appreciate the intrinsic value of nature which is often discarded in favor of economic progress. Another useful feature is regularly including nature as a topic in daily conversations, as it ensures the preservation of a strong connection to nature that is often lost as a result of living in hectic urban environments. This simultaneously opens up opportunities to have meaningful discussions that can have a positive impact on the environment.

One pitfall to avoid however revolves around the mechanics of plant growth. As *Eco* (2018) and farming games show, plants require time to grow, and yet, in *Mutazione* (2019), their growth can be easily accelerated with music. While trivializing time is best avoided, an alternative is to further emphasize interspecies relationships by making plant growth reliant on animals, additionally supporting realism.

A last minor point can be made in reference to the character Miu, who is a hunter. While hunting itself has little bearing on respect for nature, considering that it is crucial for survival, one should

avoid having trophies of animals included in games as they itemize animals and undermine building respect for them.



(Figure 26 - Trophies)

(Personal Screenshot)

[Having trophies of animals can send the wrong message that they are being hunted for pleasure and not being respected.]

5.5.7 Undertale

No discussion about the value of nonhuman life would be complete without including *Undertale* (2015, where players follow a human who has fallen into an underground realm filled with monsters who had been banished there by humans long ago. They are tasked with escaping this realm and getting back to the human world, but will have to journey across monster infested lands to do so.

This seems standard and tropey at first glance, but *Undertale* (2015) does a remarkable job at challenging the norms and encouraging respect for nature.

In *Undertale* (2015), players certainly engage in fights with monsters, but they are not required to cause harm. They can attack foes, but can also interact with them, make them happy and resolve the encounter peacefully. Monsters in the game also have normal lives, can be spoken to as regular NPCs and engage in normal conversations. While this admittedly shows signs of

anthropomorphism, the key takeaway from *Undertale (2015)* is that monsters - a typical analogy of animals in the real world - are sentient beings with individual personalities who need to be respected. It informs players that the lives of monsters matter and forces critical decision making by allowing players to choose between attacking and interacting even when monsters continually attack players, perhaps to encourage reciprocative actions. *Undertale (2015)* is thus a fantastic example of a game that can help build resilience and maturity, whilst also provoking thoughts about how animals are treated by humans. *Undertale (2015)* even serves as a beautiful illustration of human expansion and monstrosity. Humans invade natural habitats, declare ownership of the area, evict nonhumans from the area and ultimately urbanize the area. When the nonhumans living outside begin to experience resource strain, they are left with little choice but to move back into urbanity. "Oh look, monsters are invading!" is the inevitable response. In the case of reality, monsters can very well refer to bears, snakes or crocodiles, all creatures who occasionally wander into urban areas and are subsequently met with negativity. In *Undertale (2015)*, the exile of monsters to the underground by humans harkens at this dark, oft-hidden relationship between humans and nonhumans. Crucially, it makes players painfully aware of this fact by injecting a human into this exiled world, in turn helping to reinforce a feeling of intrusion and respect as discussed earlier.

There are nonetheless shortcomings such as relatability to real animals and displays of aggression by monsters, but ultimately, a similar combat system as seen in *Undertale (2015)* is an excellent consideration for a game of a similar genre which wishes to foster respect for nature. *Undertale (2015)* is that gem of a game which confirms that any genre of game can still make an impact, even if it seems contradictory at first glance. RPGs, creature collection, zoos, farms, nonhuman worlds, animal protagonists, any game can be designed to make a difference.

5.5.8 Random Encounters

Before I conclude this analysis, I would like to briefly mention some striking examples seen in games that have nothing to do with environmentalism, nature, animals, or human-nature relationships.

In *The Great Ace Attorney Chronicles (2021)*, a mouse had been stationed inside the recovery ward of Bartholomew's hospital. His/her sole purpose was sacrifice, drinking spilled poison that was intended for a human, averting what would otherwise have been a tragedy.

In *Space Pilgrim (2015)*, a cat was directly compared to a human as being of lesser value and could be exploited for testing a dangerous gadget before approval for human use.

In *Sea of Solitude* (2019), a game that is lauded for its references to mental health, seagulls are included purely for the mechanic of shooting them away.

In *Beacon Pines* (2022), an entirely nonhuman world, chicken meat is served at the cafe.

In *Cat Quest 2* (2019), an entirely nonhuman world, cats and dogs are vastly superior to all other creatures.

In *Rusty Lake Hotel* (2016), five herbivorous anthropomorphic animals are served each other's meat.

In *Pentiment* (2022), human murders necessitate extensive interventions, but a pig's murder is swiftly forgotten.

These examples illustrate the prevalence of modern anthropocentrism throughout the games industry.

6 Results and Discussion

At the beginning, this thesis set out to answer six key questions, and answers can be summarized from everything covered in the analysis thus far.

How do games represent respect for the environment? Games often represent respect for the environment by emphasizing pertinent attributes of nature, and this has been observed primarily from games in the exploration and education categories. In this analysis, *Firewatch* (2016) and *Mutazione* (2019) were shown to promote the curative properties of nature. *Eco* (2018) and *DQB2* (2019) highlighted the fragility and importance of nature, and *Eco* (2018) additionally made impacts of player actions easily perceptible, whilst *DQB2* (2019) imparted the strong teaching of nature being permanently lost once destroyed. Realism was explored as a central framework in several games, and can be represented in various game elements, such as environment choice, aesthetics, and inclusion of vivid nonhuman life. Such representations aim to allow for immersion into nature and foster appreciation for it. Realism may also include accurate depictions of human impacts, as was seen in *EcoQuest* (1991). Games like *Insurmountable* (2021) represent respect in a more literal sense, imperiling players and creating a strong personal impact. Games with overworld design or regular combat such as *Ty* (2016) and *DQB2* (2019) sometimes represent respect by achieving a sense of intrusion, or by designing for nonviolence.

How do games represent disrespect for the environment? The most common form of disrespect can be observed in player-centric or anthropocentric environments, as seen in *Crashlands* (2016) or *MHST2* (2021). Games may also turn native nonhumans and materials into endlessly exploitable resources, hinting at the destructive effects of colonialism. *Battle Chef Brigade* (2017) similarly normalized exploitation in a world where survival was not dependent on it, promoting nonliving end products over living creatures. Disrespect is also commonly seen when interference of the environment is allowed, and when modifications of natural ecosystems are trivialized. Some examples of this are the geysers in *Abzû* (2016), platforms in *Ty* (2016) or the godlike world sculpting in *DQB2* (2019). Games like *DQB2* (2019) or potentially *Insurmountable* (2021) may also stress the fact that humans are masters of nature, thereby validating and normalizing antagonistic behaviors.

How do games represent respect for nonhumans? Examples such as *Undertale* (2015), *Mutazione* (2019) and certain aspects of *Pokémon* (1996 - 2023) showed that games can positively represent respect for nonhumans, even when disrespect is more common throughout the industry. This involves realistic behavior, narrative choice, support for nonhuman individuality, promoting healthy relationships free of coercion and possibly aversion from combat. *Zoo Tycoon* (2001) showed that respect can be represented by minimizing the differences between humans and nonhumans. *DQB2* (2019) similarly eroded human superiority by allowing its monsters to assert their rightful agency. *Undertale* (2015) achieved the same, but also by forcing decision making. *Mutazione* (2019) showed an example of relationships developing naturally and being mutually beneficial. Games like *Maneater* (2021) and *Orwell's Animal Farm* (2020) represented respect by exploring alternate realities that flipped human-nature relationships without discarding important aspects of reality such as the discrimination of sharks and farm animals.

How do games represent disrespect for nonhumans? Critical examples were shown in *MHST2* (2021) and *Pokémon* (1996 - 2023), where nonhumans are seen by humans as tools, resources, slaves, experience, or vermin, based solely on human-defined metrics. Issues such as endless respawns and zero impact on ecosystems links back to negative influences of exploitation. Issues of speciesism, discrimination, dehumanization, itemization, commodification, and monstrosity were brought up, and they are far from limited to the few examples discussed in this analysis. As seen from the random encounters listed at the end of the analysis, disrespect for nonhumans is extremely prevalent and remains a cause for concern even in games which may appear to have a positive feeling. Most games can thus be seen to be anthropocentric, reinforcing human superiority and normalizing unsustainable relationships with nonhumans.

Regarding influences, it can be theorized that the two strongest negative influential effects are caused by trivializing complicated real-world dynamics and adopting an anthropocentric worldview which is prevalent in human society. Meanwhile, the strongest positive influential effects stem from well-executed player agency and realism.

So, where does this leave us? How can games be designed to foster respect for nature? Many suggestions and observations have been listed out throughout the analysis, but can be summarized as follows.

Firstly, and most importantly, any genre and mechanic can be considered as *Eco (2018)* and *Undertale (2015)* have clearly shown. Having said that, games where the environment is there for exploration and games with an educational focus still seem to be the most effective overall. The more realistic the depicted environment and its inhabitants are, the stronger the effect. Games that feature immersive experiences and healthy interspecies connections also seem to be effective. Even games that focus on exploitation or domination can have a positive influence if they are designed to highlight the issues present in the modern world, or simply if they allow players to stop and think. Having sufficient player agency can help to achieve this.

Design choices that may improve respect for the environment hinge on not centering the world around the player, or any one species. The player should exist for the environment and not the other way around. Player actions should have a noticeable impact on the environment and additionally could have meaningful personal relevance because having a powerful impact on the individual matters. For example, imagine a player starting fires in *Firewatch (2016)*, or littering in *EcoQuest (1991)*. This additionally shows that character design, narratives and context can be designed to adopt respectful or protective stances towards nature. This in turn allows tactics such as empathy, bleed, enabling appreciation, and fostering responsibility to be employed. Exploitative games teach us to avoid endless respawns. *Werewolf (2020)* promotes critical decision making. *Eco (2018)* encourages collaboration to solve environmental issues. Realism imbues *Ty (2016)*, *Werewolf (2020)*, *EcoQuest (1991)*, *Firewatch (2016)* and *Abzû (2016)* with additional relevance, and makes *Eco (2018)*'s teachings more effective. *Ty (2016)* shows us that obstacles should ideally be of natural origin, although forcing players to confront human impacts even in extreme locales such as *Insurmountable (2021)* can have a strong impact. On that note, worlds can be interwoven better into existing nature, like in *Mutazione (2019)*. *DQB2 (2019)* beautifully demonstrates that some parts of nature are lost forever when destroyed. It ultimately follows that no aspect of the environment or mechanic should be included carelessly. Environmental interactions should have a relevant purpose meaningful enough to warrant their inclusion, failing which, they should default to noninterference. An example could be “Gather X items” or “Slay X creatures” quests which encourage environmental disturbance but have no relevance, justification, or consequence.

Design choices that may improve respect for nonhumans hinge on attaching weight, agency, meaning and individuality to nonhuman lives. Ideally, game worlds should be designed to adopt biocentrism over anthropocentrism as all creatures have equal value with respect to their local ecosystems. There should thus be no species that stands out as being superior or possessing elevated importance or status. As partially glimpsed by *DQB2 (2019)*, and cleanly demonstrated by *Undertale (2015)*, this is entirely possible even in a world full of monsters. Relationships between species should also be horizontal rather than vertical. Vertical hierarchies are commonly seen and an example was shown in *Stardew Valley (2016)*. Games like *Ty (2016)* allow nonviolence whereas games like *Undertale (2015)* encourage it, whilst others like *Mutazione (2019)* or *Abzû (2016)* completely disallow it altogether, and any of these approaches can be considered. Combats can also end with a choice to kill or spare, and nonhumans can be treated as party members rather than as possessions. Contrasting old and new *Pokémon (1996 - 2023)* games shows the benefit of overworld encounters. *MHST2 (2021)*'s overly aggressive dinosaurs emphasize implementing realistic behavior and painting players as aggressors. *DQB2 (2019)*, *Undertale (2015)*, and even *Ty (2016)* additionally introduce a sense of intrusion, which may foster responsibility. *Mutazione (2019)* shows that building mutually beneficial and naturally formed relationships can be useful, as well as showing how mundane dialogs can be tweaked to include nature regularly. Many games show that high relatability to real world concepts is optimal, meaning that anthropocentric animals should be used with caution, unless they are the only reasonable way to get a particular message across or if children are the target audience. Even when potentially antagonistic structures such as zoos or farms are utilized, minimizing the distinction between humans and nonhumans can go a long way. Even when fishing, hunting, killing, or combat is required as a mechanic, death can come with consequences to aid players in understanding the value of life. Even games which turn the tables like *Maneater (2021)*, adopt nonhuman worlds, or include some form of environmentalism or ethics can minimally aid in provoking relevant thoughts.

As a brief reminder, this analysis does come with some limitations regarding the choice of games, sample size and content displayed in the games. There remain many other games out there that could provide additional design principles and a thorough examination may be recommended for any aspiring developers.

7 Further Research

The concept of respect for nature is not heavily researched, which is a reason why most of my discussions have defaulted to and focused on respect for animals and animal rights as a more easily grasped alternative. Most of the research conducted on environmentalism in games is unfortunately restricted to education (Zhonggen, 2019) (Kiili et al., 2023) (Chang & Hwang, 2019) (Mohanty et al., 2021). in topics primarily centered around climate change (Abraham & Jayemanne, 2017) and ecology (Chang, 2019) or obvious franchises such as *Pokémon (1996 - 2023)* (Bainbridge, 2014). As this analysis has made clearly apparent, games of all shapes and sizes have the potential to influence respect for nature. Thus, it is vitally important that additional research, experiments, and design investigations be done regarding the issue of how games - especially unrelated games - from across various genres influence notions about the environment.

As seen in my literature review, there have been some experiments done on games (Westerlaken & Gualeni, 2014) or methods specifically engineered to tackle a given problem such as smoking (Bloom et.al., 2021). However, it would be helpful for such experiments to be carried out on players of existing games such as *DQB2 (2019)* or *MHST2 (2021)*. After all, this thesis has only made theoretical assertions, and having hard data or evidence would make the domain of environmental games more approachable. Much potential lies in Augmented Reality or Virtual Reality games and how they impact the environment. Extensive research has been done on *Pokémon GO (2016)* (Dorward et al., 2017), but this can be extended to other titles and experimental projects. This thesis has also been unable to ascertain how games can influence daily lifestyle habits such as plastic usage, energy consumption, food wastage or dietary choice. Gamification (Krath et al., 2021) can be considered to sway lifestyle choices, but further research targeting the connection between video games and one or more of these issues is thus also recommended. Psychology also has a strong influence in swaying lifestyle choices, and brief mentions were made throughout the paper, even if no terminology or dedicated section was included on the subject. Examining how psychological techniques can be employed in game design to foster respect for nature is thus a serious consideration for future research that is recommended for study.

Even on a personal level, there are dozens of ideas and stories which I have dreamed of and wish to implement as the opportunity arises. Writing this thesis has proved an eye opener into nuances I was previously unaware of and has undoubtedly spurred the creation of further ideas. As a child, discovering the existence of new bird species such as passenger pigeons and dodos, only to then come to terms with their extinction, was a truly heartbreaking experience which cannot be expressed in words. It is my sincerest hope that no further tragedies like this happen at the hands of human activity, and I can only pray that writing this thesis will one day result in increased appreciation of this topic and the creation of new games that may make the world a better place.

Please ensure that this work is carried on in earnest, as the planet desperately needs more voices in support of the diseases that ail it.

8 Footnotes

¹ Fear appeal in the context of games can take the form of dystopian futures, which have the potential to increase awareness of environmental issues and force people to face reality (Kaplan, 2015). Dystopian worlds can be an effective way by which game designers can express their creativity and introduce concepts that may be difficult to broach in a modern setting (Tanenbaum, Pufal & Tanenbaum, 2016). A good example would be *Cyberpunk 2077 (2020)*. Night City is a place largely devoid of flora and fauna besides humans, but is also a disastrous cesspool surrounded by a lifeless desert. It is safe to say that no player would want their city to become like Night City. Playing *Cyberpunk 2077 (2020)*, players may hence learn that ecosystem collapse leads to an undesirable future, which in turn leads to the realization that nature is fragile, important and should be preserved. A similar vibe can be ascertained from games like *Submerged (2015)*, *Wasteland (2020)* or *Mad Max (2015)*.

² *Pokémon Ranger (2006)* plays with similar narratives as seen in the *Pokémon (1996 - 2023)* anime, also disallowing the capture of Pokémon, instead treating them as helpers. *New Pokémon Snap (2021)* disallows interference entirely and embodies the respectful saying “Take nothing but photos, leave nothing but footprints”. In *Pokémon Conquest (2012)*, Pokémon are pair bonded with humans.

³ Many Pokémon designs take their inspirations from real-world animals and have interspecies relationships such as predation and symbiosis. For example, Pidgeotto, an average bird, preys on Caterpie, a caterpillar. Such lore makes Pokémon analogous to animals and can thus allow thoughts or perceptions to be more readily transferable.

⁴ The harsh reality of our anthropocentric world is laid bare when considering the shocking number of sources supporting trophy hunting in African safaris. This is a potential area for further study or exploration in game design (Di Minin et al., 2016) (Ghasemi, 2021) (Lindsey et al., 2007).

⁵ A game like *Maneater (2021)* could feasibly be designed to convince someone against eating shark fin soup.

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10 Ludography

Unless otherwise stated, the references made in this thesis are with respect to the Microsoft Windows operating system and the Steam gaming platform

Abzû (2016), Developed by Giant Squid Studios, Published by 505 Games

Assassin's Creed (2008), Developed by Ubisoft Montreal, Published by Ubisoft

Aviary Attorney (2015), Developed and Published by Sketchy Logic

Backbone (2021), Developed by Eggnut, Published by Raw Fury

Battle Chef Brigade (2017), Developed and Published by Trinket Studios

Beacon Pines (2022), Developed by Hiding Spot, Published by Fellow Traveller

Beyond Blue (2020), Developed and Published by E-Line Media

Black Book (2021), Developed by Morteshka, Published by HypeTrain Digital

Cat Quest 2 (2019), Developed by The Gentlebros, Published by Kepler Interactive

Chicken Police - Paint it RED! (2020), Developed by The Wild Gentlemen, Published by HandyGames

Coffee Talk (2020), Developed and Published by Toge Productions

Crashlands (2016), Developed and Published by Butterscotch Shenanigans

Cyberpunk 2077 (2020), Developed and Published by CD PROJEKT RED

Dragon Quest Builders 2 (2019), Developed by Square Enix and Omega Force, Published by Square Enix

Dragon Quest Monsters: Joker (2006), Developed by Tose, Published by Square Enix [Nintendo DS]

Digimon Story Cyber Sleuth: Complete Edition (2019), Developed by h.a.n.d., Inc., Published by BANDAI NAMCO Entertainment Inc.

Eco (2018), Developed and Published by Strange Loop Games

EcoQuest: The Search for Cetus (Floppy Disk: 1991, CD-ROM: 1992), Developed by Sierra On-Line, Published by Sierra On-Line and Coktel Vision [MS-DOS]

Firewatch (2016), Developed by Camp Santo, Published by Panic and Campo Santo

Gloomhaven (2021), Developed by Flaming Fowl Studios, Published by Twin Sails Interactive

Insurmountable (2021), Developed by ByteRockers' Games and Published by Daedalic Entertainment

Jak and Daxter: The Precursor Legacy (2001), Developed by Naughty Dog, Published by Sony Computer Entertainment [Sony Playstation 2]

Jake Hunter Detective Story: Memories of the Past (2007), Developed by WorkJam, Published by ARC System Works and Aksys Games [Nintendo DS]

Jurassic World Evolution (2018), Developed and Published by Frontier Developments

Kona (2017), Developed by Parable, Published by Parable and Ravenscourt

Mad Max (2015), Developed by Avalanche Studios, Published by Warner Bros. Games

Maneater (2021), Developed and Published by Tripwire Interactive

Minecraft (2011), Developed by Mojang Studios, Published by Mojang Studios, Xbox Game Studios and Sony Interactive Entertainment [Microsoft Windows, Xbox]

Monster Hunter Stories 2 (2021), Developed and Published by CAPCOM Co., Ltd.

Mutazione (2019), Developed by Die Gute Fabrik, Published by Akupara Games

New Pokémon Snap (2021), Developed by Bandai Namco Studios, Published by Nintendo and The Pokémon Company [Nintendo Switch]

Orwell's Animal Farm (2020), Developed by Nerial, Published by The Dairymen

Pentiment (2022), Developed by Obsidian Entertainment and Published by Xbox Game Studios

Pokémon Black 2 (2012), Developed by Game Freak, Published by Nintendo and The Pokémon Company [Nintendo DS]

Pokémon Conquest (2012), Developed by Tecmo Koei, Published by Nintendo and The Pokémon Company [Nintendo DS]

Pokémon GO (2016), Developed and Published by Niantic [Android, iOS]

Pokémon Mystery Dungeon: Rescue Team DX (2020), Developed by Spike Chunsoft, Published by Nintendo and The Pokémon Company [Nintendo Switch]

Pokémon Ranger (Global: 2006, EU: 2007), Developed by HAL Laboratory and Creatures Inc., Published by Nintendo and The Pokémon Company [Nintendo DS]

Pokémon Scarlet (2022), Developed by Game Freak, Published by Nintendo and The Pokémon Company [Nintendo Switch]

Prince of Persia (2008), Developed by Ubisoft Montreal, Published by Ubisoft

Rusty Lake Hotel (2016), Developed and Published by Rusty Lake

Sea of Solitude (2019), Developed by Jo-Mei Games, Published by Electronic Arts

Slime Rancher (2017), Developed and Published by Monomi Park

Space Pilgrim Episode 1: Alpha Centauri (2015), Developed by Pilgrim Adventures and GrabTheGames, Published by GrabTheGames and TheGamesFortress

Stardew Valley (2016), Developed and Published by ConcernedApe

Submerged (2015), Developed and Published by Uppercut Games Pty Ltd

The Great Ace Attorney Chronicles (2021), Developed and Published by CAPCOM Co., Ltd.

Ty the Tasmanian Tiger (2016), Developed and Published by Krome Studios

Undertale (2015), Developed and Published by Toby Fox

Wasteland Remastered (2020), Developed by inXile Entertainment and Krome Studios, Published by inXile Entertainment

Werewolf the Apocalypse: Heart of the Forest (2020), Developed and Published by Different Tales

Yooka-Laylee (2017), Developed by Playtonic Games, Published by Playtonic Friends

Zoo Tycoon (2001), Developed by Blue Fang Games, Published by Microsoft [Nintendo DS]