

Environmental conflict and its resolution: The case of invasive alien species management in Cape Town, South Africa

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Declaration

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ABSTRACT

In a country as biologically diverse as South Africa, it is of critical importance to ensure that effective invasive alien species (IAS) management strategies are in place. The underlying though crucial role of public support in successful IAS management is not always recognised, and only comes to the fore when public opposition to IAS management strategies emerges as a barrier to successful IAS management, as has recently been the case with the removal of pine trees and mallard ducks in Cape Town. Studies have shown that public engagement in IAS decision making is vital in reducing impediments to consensus. In this regard, the use of collaboration and consensus-based approaches are well-established. This thesis investigates whether the decision-making processes used in Cape Town are congruent with these approaches, through the use of qualitative, in-depth interviews with both IAS managers and affected and/or interested members of the public. Results revealed an inconsistency between the actual methods used, and collaboration and consensus-based approaches. I then proceeded to identify several types of conflict between stakeholders, as well as the main challenges to effective public engagement in decision-making processes involved in IAS management. Lack of communication at all levels, and among various actors, emerged as the most significant contributor to conflict. The findings suggest that IAS managers' attempts at communicating IAS-related issues to the public are insufficient and are not as far-reaching and well-received as those managers commonly perceive them to be. This study also highlights that taking into consideration the values and attitudes of the members of the public will greatly aid in understanding their actions, and will facilitate the development of sound methods of communication. This, ultimately, has the potential to reduce conflict over the management of IAS in Cape Town.

OPSOMMING

In 'n land wat so biologies divers is soos Suid-Afrika, is dit van kritiese belang om te verseker dat effektiewe strategieë vir die bestuur van uitheemse indringerspesies (UIS) in plek gestel word. Die onderliggende, tog deurslaggewende rol van publieke ondersteuning in die suksesvolle bestuur van UIS word nie altyd erken nie, en kom net na vore wanneer publieke teenstand teen UIS bestuurstrategieë na vore kom as 'n hindernis vir die suksesvolle bestuur van UIS. Dit was onlangs die geval met die verwydering van dennebome en mallard eende in Kaapstad. Ondersoeke toon dat openbare betrokkenheid in die UIS besluitnemingsproses noodsaaklik is in die vermindering van hindernisse tot konsensus. In hierdie verband is die gebruik van samewerking en konsensus-gebaseerde benaderings goed gevestig. Deur die gebruik van kwalitatiewe en in-diepte onderhoude met beide UIS bestuurders en geaffekteerde en/of belanghebbende lede van die publiek, is ondersoek ingestel of die besluitnemingsprosesse wat gebruik word in Kaapstad kongruensie met hierdie benaderings toon. Resultate toon 'n teenstrydigheid tussen die wesenlike metodes wat gebruik word en samewerkende sowel as konsensus-gebaseerde benaderings. Ek het daarna verskeie tipes konflik tussen belanghebbers, sowel as die belangrikste uitdagings vir effektiewe openbare deelname aan besluitnemingprosesse rakende UIS, te identifiseer. Die gebrek aan kommunikasie tussen verskeie akteurs/deelnemers het na vore gekom as van die grootste bydraende faktor tot konflik. My bevindings dui daarop dat UIS-bestuurders se pogings om UIS-verwante kwessies met die publiek te kommunikeer, onvoldoende is, en nie so goed ontvang soos wat die bestuurders glo dit is nie. Hierdie studie toon ook dat inagneming van die waardes en houdings van die publiek grootliks sal bydra tot begrip van hul optrede, asook die fasilitering van gesonde kommunikasiemetodes. Dit het die potensiaal om konflik te verminder in die bestuur van UIS in Kaapstad.

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LIST OF ACRONYMS

CL	Collaborative Learning
DEA	Department of Environmental Affairs
IAS	Invasive alien species
NEMBA	National Environmental Management: Biodiversity Act
PMP	Park Management Plans
SANParks	South African National Parks
TCT	Transport for Cape Town Department
TMNP	Table Mountain National Park
TOV	Trinity of Voice
WfW	Working for Water

CHAPTER 1: INTRODUCTION

1.1 Introduction

Biodiversity has been known to cause many debates among various societal groups on a global scale, and South Africa is no exception in this regard (Bremner & Park, 2007:306; Van Wilgen, 2012:57). Invasive alien species (IAS) are often central to such debates among researchers, managers and members of the public who frequently disagree about the nature and magnitude of problems posed by the invading species, and the best ways to deal with them (Shine & Doody, 2011:400; Andreu, Vila & Hulme, 2009:1244).

Cape Town presents a special case where biodiversity management is concerned, as it forms an integral part of the Cape Floristic Region (CFR) which is not only a World Heritage Site, but also globally renowned its rich biodiversity (Holmes, Rebelo, Dorse & Wood, 2012:20). Managing IAS in the CFR, and Cape Town in particular, poses unique challenges, as the city is home to the second-fastest growing human population in the world, and is rendered even more complex by its urban setting (Rebelo, Holmes, Dorse & Wood, 2011:20). Slightly less than 20% of Cape Town's floral species, occupying less than 0.5% of South African land, are listed as endangered (Rebelo *et al.*, 2011:21). If action is not taken to mitigate the harmful affects of IAS in Cape Town, the city stands to lose a further 85 flora species in the next ten years, all of which can only found in the CFR (Rebelo *et al.*, 2011:21; Alston & Richardson, 2006:183).

Research into IAS in South Africa was brought to the attention of the public in 1995 with the Working for Water (WfW) programme. The programme was implemented to manage IAS in light of decreasing water supplies resulting from the high level of water consumption by IAS (Ntshotsho, Prozesky, Esler & Reyers, 2015:137; Richardson & Van Wilgen, 2004:45). Since 1995, attempts to manage IAS have been met with both failures and successes, and research into ways to carry out management plans is still considered crucial, as South Africa is considered to still be in a learning phase in this regard (Van Wilgen, 2012:35).

1.2 Background and rationale

It has become increasingly well known, based on research involving IAS managers, that these managers believe the general public to be one of the largest barriers, in the form of public opposition, to effective IAS management (Selge, Fischer & Van der Wal, 2011; Van Wilgen, 2012; Fischer, Selge, Van der Wal & Larson, 2014; García-Llorente, Martín-López, González, Alcorlo, & Montes, 2008). Research reveals that at the core of their opposition the public perceive themselves to be excluded from decision-making processes to develop appropriate IAS management paths (Fischer & Young, 2007:271). A growing body of literature recognises the importance of understanding public opposition to IAS management, and the development of sound methods of public inclusion in environmental decision making.

Moote, McClaren and Chickering (1997:877) brought to light that more than a decade ago it was common practice amongst environmental organisations on a global scale to meet the bare minimum requirements of public participation in the environmental decision-making process. As a result, plans were implemented based on decisions that were made before the public participated in the process, and therefore without public input. Public involvement, if it even took place, was simply a box to tick on a checklist. This practice, however, is now considered outdated, and the process is said to be more accommodating of the opinions of the public, which managers say are being included in management plans (Moote, McClaren & Chickering, 1997:877). This is not, however, reflected in Cape Town, where many IAS-management actions are opposed by the public. Despite efforts to resolve these disputes, many of the conflicts have remained an issue for a number of years, which causes considerable delays in the implementation of effective IAS-management plans (Van Wilgen, 2012:23; Van Wilgen & Richardson, 2012:60).

The prevalence of this public opposition in Cape Town begs two questions: which processes, if any, are being followed to include the public in IAS decision making in the city; and whether these processes are in line with the collaboration and consensus-based methods that are currently considered most suitable. A review of the pertinent literature in the field of social ecology has shown that a collaboration and consensus-based approach for dealing with conflicts involving environmental issues has become the most popular globally (Daniels & Walker, 1996:71). A key advantage

of collaboration and consensus-based methods is that conflict is usually encountered during the discussion stages of the decision-making process and is usually settled by the time the plans are ready for implementation (Moote, McClaren & Chichering, 1997:877; Walker, Daniels & Emborg, 2008:20).

To date, studies investigating IAS conflict in South Africa have produced equivocal results. Previous studies of such conflict in Cape Town (Van Wilgen, 2012; Van Wilgen & Richardson, 2012) did not seem to follow methodological approaches geared toward answering the questions they had set out to answer, and tended to conduct a shallow exploration of the topic without delving into the deeper complexities at play. Part of his aim (Van Wilgen, 2012) was to investigate the reasons for public opposition to IAS management in the city, and this was done by analysing the correspondence between the public and the IAS managers in newspapers. Consequently there was limited, if any, contact with the public during the study. The “public” they referred to were not given the opportunity to elaborate upon their brief outcries in newspapers about IAS management projects they did not agree with. Therefore, the depth of the data obtained in these studies is problematic. Indeed, no study focusing on public-involvement and conflict-resolution processes regarding IAS disputes in Cape Town has yet been undertaken. This gap in our existing empirical knowledge provides much of the motivation for this study, which seeks to obtain data to assist in addressing it.

The original objective of this study was to explore in detail a specific conflict concerning the management and control of a specific IAS, which included determining which social actors were involved in the dispute, which claims were being made, and how the conflict was socially constructed by the various social actors involved. I was cautioned by a member of an environmental organisation, whom I intended to involve as a participant in my study, not to undertake the study because the “debate had moved on” and it was no longer an issue of concern. I was assured, however, by other IAS managers and researchers in the area that this was not the case, but that the dispute was still ongoing.

I began to suspect that the organisation in question did not want its practices concerning public involvement and dispute resolution to be placed under scrutiny. I then undertook the task of determining which processes were actually used to resolve the conflict (or “move on” the debate), and was unable to find any information in the public domain regarding the matter. What I did discover was a trend in which public

uproar over the actions to manage an IAS erupts, usually in the form of letters written by members of the public which are published in local newspapers, with IAS managers responding through the same medium. After a few letters written back and forth between members of the public and IAS managers, the interactions eventually die down. From a review of the letters written by the public and IAS managers, it appears that the duration of this cycle is very difficult, if not impossible, to estimate, and the uproar can last anywhere from a week to a month at a time. At the point at which these interactions come to end, it is often assumed that the two sides have reached a consensus of some sort, although no information about the processes involved or the agreement is made available. Therefore, whether a consensus was reached or the debate was ignored or “squashed” by authorities remains unknown. Occasionally, a dispute concerning an IAS resurfaces, which seems to imply that the latter is the case.

A good relationship between IAS managers and various stakeholders is important for a wide range of management endeavours (García-Llorente, 2008:2969; Bremner & Park, 2007:307; Schüttler, Rozzie & Jax, 2011:175). The use of collaboration and consensus-based methods of public involvement are said to improve such relationships (Wondolleck and Yaffee, 2000:105; Walker, Daniels & Emborg, 2008:21), and thus investigating whether similar methods are used in IAS-related decision making in Cape Town is essential.

1.3 Aims and objectives

This thesis would have originally focused on only one case study, i.e. public opposition against IAS managers’ attempts to remove what have been scientifically defined as alien and invasive pine trees in the Table Mountain National Park (TMNP). During the course of this research it emerged that the removal of another IAS, mallard ducks, also escalated into similar conflict, and this second case was then included in the study. There is limited information available regarding the steps taken to deal with either the pine-tree conflict or that concerning mallard ducks.

The first aim of this study is to explore the two specific conflicts mentioned above: those regarding the control and management of pine trees and of mallard ducks in Cape Town. In particular, the causes of the conflicts and the stakeholders involved

are identified. The second aim of this study is to investigate the processes that are involved in dealing with conflicts in the two case studies. The purpose is to determine the actions taken by IAS managers from the time the conflict emerges to the stage when a supposed agreement is reached, and to determine whether a procedural framework is in place to deal with instances of conflict.

The third aim of this study is to investigate whether any existing processes of public involvement in the decision-making and conflict-resolution processes are in line with the collaboration and consensus-based methods that have become known globally as the most appropriate and effective for public participation to date. These methods are mainly used in the USA and have not been applied to the South African context. A final aim of this study is to generate recommendations as to how conflicts concerning IAS management and control in Cape Town can be better managed in the future.

1.4 Thesis structure

This thesis is structured as follows: in Chapter 2 I will present a review of pertinent literature, both theoretical and empirical, which is necessary for elucidating concepts and theories to be applied in this study. This review will also present the foundation on which invasion biology is built and how it came to be. In Chapter 3 I will discuss and justify the methodological approach followed in this study; while Chapter 4 reports on the results this study generated; and, lastly, Chapter 5 concludes the thesis, by relating the findings of this study to those of similar studies and to other relevant theoretical literature.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The southern tip of South Africa is renowned as a global biodiversity hotspot as it is home to the CFR, “one of the most diverse floras of the world”, and one of the world’s 25 most biologically diverse hotspots (Schnitzler, Barraclough, Boatwright, Goldblatt, Manning, Powell, Rebelo & Savolainen, 2011:343). At the same time, it also contains the largest number of endangered plant species in the world (Holmes, Rebelo, Dorse & Wood, 2012:28; Wynberg, 2002:233). This is of particular concern in the greater metropolitan area of Cape Town, as International Union for Conservation of Nature “Red List Threatened plants are over-represented in the city at 319, or 12% of the South African total in only 0.1% of its area” (Holmes *et al.*, 2012:31). In fact, this percentage surpasses that recorded for any other city, and is even higher than that of most countries in the world (Holmes *et al.*, 2012:31).

Bremner and Park (2007:306) state that IAS are one of the main threats to biodiversity on a global scale (Sharp *et al.*, 2011:2097), and South Africa is no exception in this regard. IAS are listed as one of the main drivers of biodiversity loss in the country, coming in a close second to the destruction of natural habitats (Holmes *et al.*, 2012:33). It is important to note that merely because a species is non-native does not mean that it is invasive, and vice versa, i.e. if a species is native it does not mean that it is non-invasive. A working definition adapted by Schüttler, Rozzi and Jax’s (2011:176) describes an IAS as a “non-native species spreading in a new area outside of its area of origin, no matter whether it exerts any negative effects on native ecosystems or not”. This definition is fitting for this study as it is not laced with scientific terminology and can be easily understood by an individual outside of the natural science domain.

Roura-Pascual, Richardson, Chapman, Hichert and Krug (2011:311) posit that it is through human activity that plants and other living organisms have been moved outside of their natural habitat into areas where they are able to aggressively compete for environmental resources, and therefore have the ability to develop a degree of invasiveness. This poses a significant threat to the environment, as it is possible that, if left to proliferate, the newly invasive species could lead to a permanent change in the ecosystems in an area (García-Llorente, Martín-López, González, Alcorlo &

Montes, 2008:2969). A change in an ecosystem due to IAS would in most cases ultimately imply that the change is human-induced, since IAS are most commonly introduced by humans. The dangers posed by IAS, and the subsequent threat they pose to the biodiversity of the CFR in particular, are the reason their management and eradication is on the forefront of the conservation agenda in the Western Cape (Alston & Richardson, 2006:183).

Holmes *et al.* (2012:34) highlight that the undertaking of conservation actions is a “social process”, as the impacts of such actions can often ripple through various human dimensions, such as economic, social, cultural and geographical aspects of human life; however, the actions themselves are ultimately derived from scientific, specifically natural science, research. It is usually in the implementation phase, when natural science meets the social sphere, where most conflict arises. Although conflict of this nature is regularly reported in the media, a review of pertinent scholarly literature reveals a paucity of information on the processes followed to deal with the conflict.

2.2 The history of invasive alien species in South Africa

South Africa presents a special case when one considers the ecological history of the country, and Cape Town is of particular interest, as it was used as a port during the colonial era. Owing to the country’s changing nature, one cannot deduce its socio-ecological services by considering a single time frame alone. Rather, one needs to view it as a moving picture to fully grasp the evolution of its ecological processes over time (Anderson & O’Farrell, 2012:28).

2.2.1 The case of pine trees

The first people to settle on the land were the San and the Khoekhoen, and it is also between these two groups of people that we see the first recorded instance of conflict over natural resources (Anderson & O’Farrell, 2012:28). Between 1650 and 1700, South Africa became a stopover-point for ships between trades to replenish their resources. As such, the environmental state of Cape Town rapidly degraded early in the 1700s as forests were stripped of their timber, and by 1720 the wood stocks were completely exhausted (Anderson & O’Farrell, 2012:32). In attempts to replenish the

wood stocks, the 1800s were marked by extensive afforestation driven by colonial powers and these attempts are among the first records of the introduction of alien vegetation, majority of which consisted of pine trees (Anderson & O'Farrell, 2012:33). At the time, it was believed that the trees would promote a cooler climate by increasing rainfall, decreasing instances of fire, and adding to the aesthetic appeal of the land in which trees had never comprised a large part of the natural vegetation (Anderson & O'Farrell, 2012:33). The plantations spoke to the inclusion of Cape Town in the global economy (Anderson & O'Farrell, 2012:34).

The alien trees were planted as a way of correcting what was at the time perceived as an ecosystem "disservice". However, it was not long before the invasive properties of the alien vegetation began to prevail, and it thrived in Cape Town without the natural controls present in its countries of origin (Anderson & O'Farrell, 2012:34). The pine trees began to spread rapidly outside of their plantation boundaries (Van Wilgen & Richardson, 2012:57).

Despite various attempts to control woody IAS, they still persist, and ecosystem services in Cape Town are still at risk and undergoing detrimental changes (Van Wilgen, 2012:31). In 2012, invasive pine trees were reported to have invaded just less than 140 000 ha of land outside the planned planting sites since they were introduced (Van Wilgen & Richardson, 2012:57). This has spurred the development of programmes such as Working for Water (WfW) – which is aimed at improving ecosystem services, in particular water delivery, while simultaneously creating jobs through conservation – and the establishment of the City of Cape Town's Biodiversity Management Branch, of which IAS management forms a large part (Van Wilgen, 2012:31). Commercial pine-tree plantations have had negative environmental impacts, such as substantially decreasing the surface runoff of water in Cape Town, as well as causing a significant loss of biodiversity within and around the plantations (Le Maitre, Van Wilgen, Gelderblom, Bailey, Chapman, & Nel, 2002:144). Despite efforts to mitigate the problems presented by pine trees, the attempts to manage the environmental impacts on pine trees have resulted in conflict situations between foresters, environmental managers and residents of the greater metropolitan area of Cape Town (Van Wilgen & Richardson, 2012:57). If current management attempts, namely the felling of pine trees, continue, Van Wilgen and Richardson (2012:57) predict that the problem of pine trees and the subsequent conflict is likely to worsen.

Attempts have been made to replace the invasive pine trees with native and non-invasive trees through various fynbos rehabilitation programmes around Cape Town. These have proved unpopular with urban residents who enjoyed the shade provided by the pine trees for recreational activities, particularly since the replacement trees generally take a few decades to grow to a height that provides these benefits (Van Wilgen & Richardson, 2012:60). In addition, members of the public have expressed their disapproval of the loss of aesthetic appeal that the pine trees provided, and have made gaining public support for further pine-removal operations challenging for environmental managers (Van Wilgen, 2012:23; Van Wilgen & Richardson, 2012:60). Another barrier is that, even if management data which incorporates social, political and economic factors concerning IAS are obtained, those data need to be combined with good-quality species-distribution data in order to carry out effective management plans (Roura-Pascual, Richardson, Krug, Brown, Chapman, Forsyth, Le Maitre, Robertson, Stafford, Van Wilgen, Wannenburg, & Wessels, 2009:1596). Location of the target species is therefore important to consider when implementing management actions. Location can also be a cause of conflict in the management of IAS, especially in a city such as Cape Town, where different locations are managed by different organisations or interest groups (Epanchin-Niell, Hufford, Aslan, Sexton, Port & Waring, 2010:210) Sometimes different government departments want to carry out contradicting work on the same site – what Epanchin-Niell *et al.* (2010:215) refer to as “management mosaics”. This renders the management of pine trees in Cape Town more complex, as not only are there “management mosaics”, but research into social dimensions is rarely included in the factors considered in the amalgamation of data.

2.2.2 The case of mallard ducks

After a wide literature search, academic resources on the introduction of Mallard Ducks (*Anas platyrhynchos*) into South Africa appear limited. Information concerning the topic can mostly be found in various reports compiled by environmental and conservation organisations in Cape Town, as well as letters written by members of the public to local newspapers. However, there is a scarcity of academic literature detailing how mallards have become a conflict species causing strife between the IAS managers who attempt to control the species and the members of the public who

oppose these management efforts. There is, however, an abundance of literature on the biological and disease-related aspects of the species in relation to their presence in South Africa (e.g. McCathy, 2006; Banks, Wright, Maclean, Hann & Rehfish, 2008; Blackburn, Lockwood & Cassey, 2009). A fruitful source of information regarding the mallard duck and the way forward in terms of their management in the South African context can be found in the mallard strategy for South Africa (Stafford, 2010), a report compiled by the leading avian researchers in the country for the City of Cape Town's Invasive Species Unit, which is tasked with controlling the species. The report contains eight goals, as well as strategies for achieving those goals to control the species. The strategy is aimed toward significant mitigation, by the year 2020, of harmful effects of the mallard duck on indigenous waterfowl in South Africa. Although eradication of the species seems unlikely, IAS managers are still hopeful that it is a possibility (Stafford, 2010:8).

The mallard duck is possibly the world's most abundant duck, having spread to numerous countries outside of its native land, including "Australia, India, New Zealand, Hawaii, Mexico and South Africa" (Stafford, 2010:20). The species was introduced to South Africa in the 1940s through the pet-trade, as they tend to be visually appealing, tame and easy to breed (Stafford, 2010:7). People have also used mallards for duck hunting, and by the 1960s it was common to find mallards being sold in the country (Stafford, 2010:21). Currently, mallards can be found throughout South Africa, with their largest concentration in the Western Cape, and from a conservation standpoint it is the bird species that raises the most concern at present (Stafford, 2010:20). Mallards, according to Gichohi (2010:46), pose a major threat to the indigenous waterfowl of South Africa in two ways: 1) they hybridise with native species, thereby decreasing the numbers of yellow-billed ducks (*Anas undulate*), African black ducks (*Anas sparsa*) and Cape teal (*Anas capensis*), and propelling genetic dilution amongst these species; and 2) they compete for food and territory with the indigenous waterfowl species. The hybridised offspring are fertile and could potentially, over time, lead to native waterfowl becoming extinct (Stafford, 2010:21). Such has been the case with the Mexican duck, which became extinct due to hybridisation with the mallard duck (Hockey, 1989).

Mallard ducks are listed as a Category 1b species in accordance with the National Environmental Management: Biodiversity Act (NEMBA) 10 of 2004, which indicates a need to control the species, and once a control plan has been set for an area, no

person in that area may possess a mallard duck without obtaining a permit (Republic of South Africa, 2014). The management of mallard ducks in Cape Town should not be a difficult task, as the species tend to gather in areas where they receive regular sources of food, a large amount of which seems to originate from humans, as residents enjoy feeding the birds (Hockey, 1989). It is this high level of human involvement with mallard ducks that has led to controversy concerning their management: mallards are considered as pets by many residents of mallard-prone areas who therefore do not support management plans to control the species (Stafford, 2010:10). According to Stafford (2010:20), a major reason for the opposition from residents is their lack of awareness of the harmful effects the species has on the South Africa's native biodiversity. It is for this reason that the City of Cape Town embarked on the development of a new campaign to spread awareness of the threat posed by mallard ducks. The campaign was rolled out in 2012, in accordance with the suggestions and guidelines listed by Stafford (2010). The main objectives of this campaign were to communicate a clear message to a target audience, which would gain their support via different media channels (Stafford, 2010:16). It was noted by Stafford (2010:10) that it is "important not to stop communicating and building awareness through all the phases of the programme". It was anticipated by IAS managers that this campaign would decrease the level of controversy and sensitivity around the control of mallard ducks, and result in a smoother management process and increased levels of public awareness regarding mallards. There have been no subsequent reports from the City of Cape Town regarding the mallard strategy since the campaign was implemented in 2012.

History has shown that, in the case of Cape Town, management plans are often informed by varied perceptions as well as the changing needs of people. In other words, perceptions vary and can alter from one cross-section of time to another. In the present day, IAS management plans are therefore informed by current perceptions of IAS, but these also change in light of new information arising from ongoing studies in the field of invasion biology in South Africa (Van Wilgen & Richardson, 2012:56). It is therefore difficult to say, with any certainty, where IAS management is headed in South Africa, especially since managers and scientists are still in the learning phase of management implementation as well as research on the issue (Van Wilgen, 2012:35).

2.3 The emergence of environmental sociology

The first Earth Day, which took place in 1970, is said to have set the tone for a new wave of environmentalism in the USA, which soon spread to many other countries after it had emerged as a topic of concern in the American media (Hannigan, 2006:1; Cox, 2010:3–4; Gottlieb, 1993:199). The induction of Earth Day gave birth to the “Environmental Decade”, during which sociologists found that they lacked theory and a relevant body of empirical research that allowed them to fully comprehend the link between people and nature (Hannigan, 2006:1). Although some sociological work with an environmental focus had been conducted by then, none of it was substantive enough to form the base of a larger body of literature.

One of the reasons sociologists were incapable of fully understanding the way that people relate to nature, is that sociology in the 1970s generally dictated that human beings are separate from the natural world, in that they are not bound by the limits of nature as other species are (Hannigan, 2006:3). Another reason was that sociologists believed that the link between nature and people is directly related to the level of development of a society. It was therefore thought that, as time went by, the relationship between society and nature would weaken, as societies became more modern and advanced (Hannigan, 2006:2–3). Goldman and Schurman (2000:564) suggest another reason why the relationship between society and nature had not been explicitly theorised by the great social thinkers, i.e. their attempt to establish sociology as its own field of enquiry, completely devoid of any relation to the physical sciences from which they were attempting to break away (Goldman & Schurman, 2000:564). Early sociologists romanticised the positivist epistemological core of the natural sciences, as it was outside of their fairly unstructured way of thinking. However, there was a need to distinguish the social sciences from the natural sciences in order to legitimise sociology as an established discipline, i.e. “sociology really came into being by defining what it was not” (Erwin, 2010:14).

In their protracted search through theoretical literature for any mention of human–nature interactions, sociologists such as Hannigan (2006) eventually turned back to the founders of the discipline, such as Émile Durkheim, Max Weber and Karl Marx, to seek references to the environment. It was found that such references were implicit in their work which was written in the context of their time. Although mention of the environment is present in the works of these classical social theorists,

scholars such as Goldblatt (1996:1–6) urge caution in assuming the validity of these references, due to the possible lack of an “adequate conceptual framework” at the time, resulting from a poor understanding of the complexities of human–nature interactions. Järvikowski (1996:82–3) supports this notion by implying that, although their theories may have been correct for their time, they were not intended for consideration in an environmental framework, and they may not apply to the human–nature relationship we have today, as the context has changed over time. A few scholars, however, still maintain that, regardless of these considerations, it is still worth revisiting the works of such esteemed theorists and extract assertions that may apply to the environment (Hannigan, 2006:5–6).

According to Hannigan (2006:6) and Erwin (2010:15), the concepts and ideas of Émile Durkheim are said to be the least relevant of the three theorists’ to our current environmental context. He believed that reality was an outcome of social facts, and that social facts are determined by other social facts (Erwin, 2010:15). Durkheim (as cited in Hannigan, 2006:6) defines social facts as “any way of acting, whether fixed or not, capable of exerting over the individual an external constraint”; these constraints could take the form of “laws”, traditions and moral standards. Durkheim (1982:53) therefore suggests that our beliefs and subsequent actions, which we believe to be a product of our own consciousness, is in fact a product of pressure from a source outside of ourselves. An important feature of social facts is that they are commonly carried out in the collective and not by an individual acting on his/her own (Durkheim, 1982:54). Individuals are often unaware of these external pressures, and they emerge only when the individual acts alone or when he/she strays from the beliefs and practises dictated by the social facts (Durkheim, 1982:51). When individuals break away from these coercive powers, the powers then act against them in the form of alienation or exclusion (Durkheim, 1982:51). Other facts, such as biological facts in the case of this thesis, should not take precedence over social facts, as Durkheim believed that reality could not be adequately explained by biological facts alone (Erwin, 2010:15). Therefore, Durkheim discouraged “non-sociological approaches”, characterising them as nothing more than reductionist (Hannigan, 2006:6; Erwin, 2010:14–15).

In light of the growth of capitalism, Max Weber adopted a different approach to the environment, in that he saw nature as something that was present for humans to make use of in any way they saw fit – i.e., it existed solely for our consumption.

Nature, in Weber's eyes, was a resource to fuel the economy, with economic efficiency and expansion as the most important goals (Hannigan, 2006:7). Weber insisted that there was no need to view the environment from an ecological perspective; as long as it made sense, from an economic perspective, to make use of natural resources, that was all that mattered (Hannigan, 2006:7).

Of the three sociology pioneers discussed here, the works of Karl Marx seem the most applicable to the current environmental context we are in today. Hannigan (2006:8) suggests that Marx's early theories on social structure and social change provide the base from which current concepts and ideas relating to the environment have stemmed. Marx and his colleague Friedrich Engels hypothesised that capitalism perpetuates the estrangement and alienation of working-class citizens, not only from their work, but also from the natural environment.

Therefore, Marx and Engels saw capitalism as the root of the destruction of nature, as it altered and weakened the relationship people had with nature. The only solution these theorists saw was a working-class rebellion that would lead to the defeat of the upper class and to the ultimate demise of the capitalist regime (Hannigan, 2006:8). They believed that the time had come for a new human–nature connection to develop. In his earlier work, Marx suggests that people will engage in the “humanization of nature”, through which they will develop a sense of compassion toward nature and better appreciate its complexities (Hannigan, 2006:8). However, from his later work one can deduce that the type of human–nature relationship he favoured was one in which people are dominant over nature and develop a disregard for ecological factors.

The environmental movement of the 1970s facilitated the creation of subdivisions within the field of ecology, each aimed at focusing on different areas within the discipline. At the same time, ecology as a field of study appeared limited when it became clear that natural science enquiry alone was not sufficient to answer questions concerning human–nature interactions, as it did not take into account elements introduced by human influence (Lowe, Whitman & Phillipson, 2009:298). Therefore there is an ever-increasing need to define the relationship between humans and nature, or at least include this relationship in the descriptions and investigations of environmental issues (Lowe *et al.*, 2009:298). Thus, it has been recognised that merging knowledge from the natural sciences (biological facts) with knowledge from the social sciences (social facts) is necessary in order to take a holistic approach to

solving environmental problems (King, Biggs & Loon, 2007:91). This is ironic, as ecology was essentially considered completely separate from the social sphere (Lowe *et al.*, 2009:297). Over the last 25 years, engagement between ecology and the social sciences has increased, as reflected in the advent of academic journals such as *Ecology and Society* (Lowe *et al.*, 2009:300). Initiatives to cross the disciplinary divide have originated from both sides. In the case of this study, a holistic approach is taken in which both biological facts and social facts are taken into consideration.

2.4 Social aspects of invasion biology

During the 1970s, often referred to as the “environmental decade” of the northern hemisphere (Hannigan, 2006:1), sociologists, as mentioned above, became aware of the fact that they lacked theory and a relevant body of empirical research that allowed them to fully comprehend the connection between people and nature. This realisation took somewhat longer to emerge in South Africa, and this applies even more so to research on IAS: although a large body of literature exists on the ecological impacts of IAS on the environment, very little research has been conducted on social dimensions of IAS, and almost none can be applied directly to the South African context. This is despite arguments such as Robbins’s (2004) that invasions are less of a biological process than a social process, and it is therefore the sociobiological networks that are invasive, not the species themselves. Also, many academics highlight the urgency for social dimensions to be factored into studies on IAS, as they are considered of great importance (Pejchar & Mooney, 2009; García-Llorente, 2008:2969; Bremner & Park, 2007:307, Fischer & Young, 2007; Schüttler *et al.*, 2011).

Andreu, Vila and Hulme (2009:1244) emphasise the significance of understanding how different stakeholders perceive the problem of IAS, and how it is subsequently managed. Sharp, Larson and Green (2011:2097) and Schüttler *et al.* (2011:175) support this argument, by emphasising that the human element of IAS should not be overlooked or underestimated, and they advocate for the development of a unique framework through which to identify stakeholder characteristics and perceptions in countries affected by IAS. Such a framework can be crucial in determining the point at which different stakeholders’ perceptions come into conflict

(Sharp *et al.*, 2011:2103), and it could potentially inform an IAS-management plan that is considered both ecologically appropriate and socially acceptable by various stakeholders. Schüttler *et al.* (2012:182) suggest a number of ways in which public participation can be more effective in environmental decision making with regard to IAS. First, knowledge should be shared between scientists and the public: scientists should consider the local knowledge people have and, in turn, should promote public education on the environmental impacts of IAS. Secondly, perceptions of IAS should be thoroughly investigated and any disagreements stakeholders have should be discussed through a “democratic process” (Schüttler *et al.*, 2012:182). Thirdly, environmental managers should see to it that proposed management plans are accepted by all stakeholders, and if they are not, changes should be made accordingly. Lastly, the public should be allowed to voice their opinions throughout the implementation process and, if conflicting views are encountered, they should be dealt with in the same way as earlier in this process.

Although the research project proposed here acknowledges the importance of developing a framework to identify stakeholder perspectives and to determine when they come into conflict, it is also important to develop a framework for analysing the conflict itself. Such an analysis can aid in the suggestion of approaches that can be followed to diffuse the conflict as much as possible. Daniels and Walker (2001:73) stress that environmental conflicts between different stakeholder groups are common and, in many cases, inevitable, as different stakeholders often have different agendas and goals, both within and across stakeholder groups. In light of the frequency of conflicts concerning IAS, the focus in this study will therefore be on analysing conflict involving IAS, namely the conflict concerning the removal of pine trees and mallard ducks in Cape Town. In order to do so, frameworks that place emphasis on a variety of types of stakeholders’ participation in environmental decision-making processes will be considered in more detail. Holmes *et al.* (2012:34) identify possible stakeholders to be “local politicians, government officials from non-biodiversity sectors, land owners, and local communities”, to name a few.

In South Africa, Van Wilgen (2012) also expresses the need to understand differences in stakeholder perceptions, especially when these differences result in a situation of conflict, as is the case in Cape Town. He describes the conflict between, on the one hand, groups of individuals (referred to in this study as pro-pine groups) who are opposed to the removal of pine trees because those trees are perceived to

exhibit many positive attributes; and on the other hand, the SANParks officials at the TMNP who want to mitigate what they perceive as negative impacts of an IAS, by removing those trees. A recent preliminary review, undertaken in this study, of various sources, including newspaper clippings and posts on online fora, seems to indicate that the majority of the pro-pine contingent has congregated under the “Shout for Shade” campaign, which argues in favour of retaining the invasive alien trees in TMNP, on the basis that these trees provide shade for the public. Van Wilgen (2012) posits that the claims made by the pro-pine groups can easily be countered by presenting the scientific facts underlying the claims of environmental managers. However, the negative impacts of invasive alien plants (IAPs) on the environment, which are framed as scientific facts, are claims about what should be considered an environmental problem, or not. These claims are made by scientists who are in a position of power, as the facts they present are what drives environmental policy. In fact, Van Wilgen (2012) states that the success of many eradication projects can be ascribed to the “strong body of scientific evidence that could be cited” to endorse and gain approval for such projects. This shows that environmental managers, such as SANParks officials, and scientists support and reinforce each other’s positions. In keeping with the social constructionist lens adopted in this study, these scientific facts are, however, considered by social scientists such as Hannigan (2006) to be socially constructed.

Van Wilgen is a terrestrial ecologist and is considered to be an expert on the management of IAP species in South Africa, especially invasive pine trees. A recent study he conducted aims to outline the ecological reasons underlying attempts to control and remove the pine trees in TMNP, as well as to provide insight into the current conflict between SANParks and pro-pine groups (Van Wilgen, 2012). A key element of Van Wilgen’s study was to explore the perceptions pro-pine groups hold, which contribute to their desire to save the pine trees. This, Van Wilgen (2012) says, is important, because the general public as well as other interested stakeholder groups are often the source of opposition to management plans. Studies that aim to investigate public perceptions and opinions of IAS are increasing in popularity, as people are often considered by managers as constituting the largest barrier to effective management programmes (Fischer & Young, 2007:271). There has been a noticeable increase in trends to incorporate the public’s voice when drafting management plans

and laying down the foundations for environmental policy, of which policy on IAS forms part (Fischer & Young, 2007:271).

Van Wilgen explored the perceptions pro-pine groups through an analysis of articles published in the press that were written by members of the public. From a close reading of his work, it can be deduced that he positions himself on one side of the conflict, namely that of the SANParks officials. He is intent on devising a solution for the conflict, which will ensure the success of control programmes aimed at managing IAS within the TMNP grounds, but without paying much attention to the opposing claims made by pro-pine groups. Indeed, the opposing claims are dismissed by Van Wilgen (2012:23) as based on “incorrect beliefs”, and claims that aesthetic appeal has been lost due to the removal of invasive alien trees are downplayed as mere “perception”, as they are not based firmly in scientific fact. Most studies investigating public opinion on biodiversity and environmental management recognise only scientific knowledge as legitimate, thereby disregarding opinions that the respective researchers construct as scientifically unsound (Fischer & Young, 2007:271). Van Wilgen’s (2012) paper is an example of such a study, as it dismisses oppositional public opinion on the management and control of pine trees in Cape Town, on account of the fact that such opinion is based on lay knowledge and a lack of adequate education, rather than on scientific fact. Since such a dismissive stance has been predominant in the literature, in-depth investigations of public opinion are limited, and therefore need to be expanded in order to effectively take those opinions into consideration in environmental decision making (Fisher & Young, 2007:271).

One could interpret Van Wilgen’s study as a platform for natural scientists to respond to pro-pine groups’ claims that often portray SANParks’s efforts to remove the pine trees as undemocratic and unnecessary. However, I would argue that his study is a biased and somewhat superficial exploration of the perceptions of pro-pine groups. Essentially, Van Wilgen is an invasion biologist and may therefore be subject to the in-group vs. out-group bias inherent within the discipline, which will be explored in more detail later in this section. His study can be improved upon, as I intend to do, by delving deeper into the social constructions underlying the conflict, and thereby to explore both sides of the conflict adequately. On the basis of numerous focus groups discussions, Fischer and Young (2007:278), who examined individuals’ mental constructs of biodiversity in Scotland, found that, despite the public’s limited scientific knowledge, they formed complex constructs of biodiversity, and this does

impact their thoughts on how it should be managed. García Llorente *et al.* (2008:2979) produced similar results from their study in Doñana, Spain. Such mental constructs are therefore an important focus of my study.

2.5 Invasion biology: a pseudoscience?

Some ecologists have argued that environmental change over time is a natural process, and that the problematising of IAS and the subsequent concern for the topic is unwarranted (Larson, 2007:993). David Theodoropoulos (2003) is one of these ecologists. He amassed more than 30 years' experience in the field of ecology, during which he was exposed to different streams within the discipline. His diverse work experience, he postulates, has qualified him to decipher whether the claims made by conservationists and invasion biologists are warranted by the available data. Theodoropoulos's (2003) argument is that invasion biology is a pseudoscience – a science that is thought to be based on a scientific foundation, but is actually based on claims and beliefs that are not scientifically justified. Theodoropoulos (2003:3) posits that the majority of the claims made by conservationists and invasion biologists cannot be objectively verified by data generated in the field. He continues to say that research in invasion biology is nothing more than “repetition of subjective and anecdotal observations” and “unjustified generalizations”.

The core of invasion biology, Theodoropoulos (2003:77) suggests, is built on the premise of fear that defines human interactions with the environment. The founders of this field, whom Theodoropoulos (2003:83) refers to as the “architects of invasion biology”, identified the fear resulting from the uncertainty inherent in nature and human interactions with nature, and used this fear to manipulate and construct the social reality of IAS as problematic. To seek answers as to why the discourse of IAS has secured such a dominant standing in the academic sphere, which is permeating the rest of society, is to look into the construction of the social problems. The purpose of this section is not, however, to delve into the human mind; rather, it is to explore the contributing factors that help invasion biology thrive as a field of inquiry and, consequently, an environmental “dilemma”.

2.5.1 Prejudice and power

Theodoropolous (2003:79) states that the complexity and uncertainty associated with nature results in the development of prejudice in the way people perceive and interpret nature, and more specific to this study, IAS. In order to simplify the world and the things we understand, humans have a tendency to make use of the distinguishing features of categorisation, such as “right” or “wrong” and, in the case of this study, “native” or “alien”. Once in place, these categorisations are difficult to alter, and play a vital role in how we perceive things (Allport, 1954:164-174). Kuhn (1962:64) illustrates the human need for categorisation through an example involving playing cards. Participants were flashed playing cards they had seen before, but also included in the mix of cards were a few unknown cards that no participant had seen before. When the participants were shown the cards they were unfamiliar with, they felt uncomfortable and showed signs of distress, because they had not had a chance to categorise the cards, as they were encountering them for the first time. According to Kuhn (1962:64), approximately 40 encounters with the unknown cards ensured that the participants felt comfortable, which is when they had intrinsically developed categories for these cards. This demonstrates that people have a tendency to categorise objects in order to simplify their understanding and to know how to feel when engaging in a certain topic or when encountering a certain object.

Allport (1954:166–167) posits that this propensity to categorise information leads us to bring preconceptions into the selection and interpretation of data. Therefore, it is possible that scientists may bring bias into data collection and analysis based on the categorisation or prejudices they have developed with regard to their research topic or question. Theodoropolous (2003:80) provides an example of how preconceptions may play a key role in how data are received, interpreted and presented. He does so using a study by Parker, Mertens and Schemske (1993) that investigated the distribution of a non-native species in a disturbed area compared to a non-disturbed area. Their data show that the non-native species in the disturbed area, although present, has not become invasive, yet they emphasise the need for long-term monitoring in the area, due to the presence of the non-native species. A strong standpoint in their paper is that the presence of the non-native species challenges the integrity of the native plant communities, yet the data show that the species has not become invasive, and that human disturbance is the driver of environmental change in the area. Theodoropolous

(2003:80) concludes that the categorisation of native/non-native with which Parker *et al.* (1993) begin their research plays a major role in the way data are interpreted. Allport (1954:190) hypothesises that once prejudices have been established they “cause their possessor to view future evidence in terms of the available categories” to such an extent that not even logic or reason can interfere with preconceived stereotypes.

An important characteristic of prejudice is that it propels people to surround themselves with likeminded individuals who categorise objects in a similar fashion. Accordingly, Duckitt (1992:68-69) speaks of in-group vs. out-group patterns in prejudice, explaining that if one is part of a group of people with similar interests or desired outcomes, then one is part of an in-group. Any individual that does not have the same interests or desired outcomes as that group is consequently part of the out-group. Empirical studies have shown that people have a tendency to harbour bias in favour of the in-group and hold feelings of distaste towards the out-group (Duckitt, 1992:68–69). Theodoropolous (2003:80-81) applies this in-group vs. out-group theory to invasion biology, by arguing that the in-group consists of indigenous species, while the out-group is comprised of alien species. He implies that these categorisations made by IAS managers, who are inherently part of the in-group, cause them to have immediate distaste for the out-group, which is comprised both of IAS as well as individuals who do not support those managers’ IAS management efforts, despite what empirical evidence may reveal about an IAS. In-group vs. out-group bias plays a key role in the dynamics of IAS-manager–public relations and communication, of which antilocution comprises a large part. This concept will be explored later in this section.

“He who fights monsters should take care, lest he become a monster in turn” – Nietzsche (as cited in Theodoropolous, 2003:63). By referring to these words of Nietzsche, Theodoropolous (2003:63) implies that those who eradicate alien fauna and flora in pursuit of protecting indigenous species are in turn becoming the “monsters” they are trying to protect indigenous species from. He further states that often, those who are obsessed with purity tend to be most impure thereby inferring that invasion biology is nothing more than an extremist ideology based on “flawed internal logic” (Theodoropolous, 2003:63). Some of the IAS that are targeted for removal in their new host environments are classified as endangered in their country of origin; therefore, eradicating these species to impede the endangerment of native

species will propel their own endangerment (Theodoropolous, 2003:63). This suggests that invasion biologists and environmental managers have the same impacts as the IAS they are attempting to remove. Theodoropolous (2003:15) posits that invasion biology is laden with assumptions that scientists and environmental managers know what “natural” is. Subsequently, what they assume to be “natural” is not only preferable to them, but also preponderant to the current environmental state. The question here is, why do scientists and managers have the power to decide what is “natural” and to impute the degradation of the “natural” environment to IAS?

Theodoropolous (2003:87) states that invasion biologists give themselves the right to govern what they believe nature should look like. Martínez-Abraín and Oro (2013:539) also attest to the dogmatic dynamics that are present in the field of invasion biology. The classification of non-native species as necessarily “bad” and potentially hazardous, before the specific species has been adequately investigated, demonstrates elements of dogmatism (Martínez-Abraín & Oro, 2013:540). Not only do invasion biologists and IAS managers assign themselves the right to dictate what is “natural” and what is not, they also have the power to punish those who do not agree with this perception, or do not support their pro-native drive. This denotes the social power Theodoropolous (2003) claims invasion biologists possess.

The concept of power is one that sociologists have experienced great difficulty in defining (Dépret and Fiske, 1993:178). It is beyond the scope of this thesis to discuss in detail the vast empirical literature on control and power, but it is important to point out that the concepts of power and control can be applied to the context of this study. Classic sociologists have claimed that the need and desire for dominance are inherent in our nature as human beings (Dépret and Fiske, 1993:186). It is anxiety, brought on by uncertainty, which causes humans to fight for power, as power is used as a tool to alleviate feelings of uncertainty and anxiety. In the case of this study, the uncertainty associated with the current and future state of the environment, as outlined by Theodoropolous (2003), is a major cause for anxiety amongst natural scientists, and therefore explains their desire for and possession of power. If one has control in a situation of uncertainty, one is likely to feel less anxiety than those who are powerless (Hendrick, 1943).

In order for the invasion biologists to maintain their control over the outcomes of the public’s interactions with IAS, they need to ensure that they maintain a certain level of influence over members of the public. In this regard, Dépret and Fiske

(1993:178) state that “the power of the powerful would rest entirely in the behaviour of the powerless: power vanishes as soon as influence disappears”. In the case of this study, the concept of power becomes a point of focus in the interactions between invasion biologists and members of the public who comprise various IAS stakeholder groups; in this sense, one is referring to social power. Social power begs the question of “power over what”? Dépret and Fiske (1993:183) provide four possibilities for control: “oneself, one’s outcomes, others’ self, and others’ outcomes”. Control over others’ self and others’ outcomes are of importance in this study, as they refer to: 1) the power of influence one has on others’ perceptions and behaviour; and 2) control over “environmental events of motivational relevance to other people”, which Thibaut and Kelley (1959) refer to as “fate control” (Dépret and Fiske, 1993:183).

These forms of power are consistent with the kind of power Theodoropolous (2003) claims is exerted by invasion biologists. But what about those who are considered powerless, namely those who oppose the claims made in invasion biology? Experiments have been conducted in which participants were deprived of control in order to ascertain their response to a lack of power. One of the reactions described by Pittman and D’Agostino (1985) was information-seeking: participants showed elevated levels of interest in areas where their control was restricted, and actively sought improve upon their knowledge. An alternative response, outlined by Brehm (1966), involves participants exhibiting feelings and actions motivated by anger and hostility in a struggle to regain power. The latter denotes the situations of conflict that commonly arise between IAS managers and members of the public concerning the management of IAS.

2.5.2 IAS as a “scapegoat”

Theodoropolous (2003:70) claims that the notion of prediction in invasion biology is a fallacy. He states that it is near impossible to foretell the characteristic changes of introduced species, nor is it possible to foresee the responses of indigenous species when they encounter IAS. There are many reasons for this, but mainly species act idiosyncratically, and one species’ similarity to another is not an adequate foundation on which to predict characteristic changes or responses in light of invaders (Theodoropolous, 2003:70, Liu, Sheppard, Kriticos & Cook, 2011:2328). Changing interactions are often unforeseeable and species-specific (Liu *et al.*, 2011:2328). Even

if the highest standards of control are used in experiments geared toward prediction of IAS behaviour in a new habitat, data are insufficient to generate any reliable conclusions (Liu *et al.*, 2011:2329). This creates an environment of high uncertainty for conservationists and invasion biologists (Liu *et al.*, 2011:2323) and, as shown earlier in this section, uncertainty breeds tension.

Theodoropolous (2003:84) speculates that when a group is experiencing tension or uncertainty over something, they have a tendency to project this uncertainty or tension onto a chosen “scapegoat”. This notion is borrowed from the “frustration-aggression-displacement theory of prejudice” which hypothesises that, if a source of frustration cannot be identified due to uncertainty, then it is most likely to be attributed to a “convenient” victim (Duckitt, 1992:71). Babad, Birnbaum and Benne (1983:103) support this view in their investigation of group dynamics, when they argue that “when there is tension and social problems seem insurmountable, [people] find an innocent, weak, and distinctive group to blame and victimize”. Stephan (1983:425) emphasises the dynamics of power at play in the process of “scapegoating”, by stating that it is common for a group with more power to victimise and place blame on a group with less power. Theodoropolous (2003:84-85) suggests that this is indeed the case in invasion biology: due to high level of uncertainty with regard to the current and future state of the environment, scientists have looked toward IAS and an easy victim to blame for environmental deterioration. IAS are the perfect scapegoat, says Theodoropolous (2003:84), because they are not unable to defend themselves, nor are they able to escape the negative attention. This idea is also put forth by Allport (1945:224), who states that, “[w]hen anxiety increases, accompanied by a loss of predictability in life, people tend to define their deteriorated situations in terms of scapegoats”. It is difficult to reach a conclusion as to what the “truth” is, as the “truth” is fluid and undergoes constant changes; ultimately, the struggle for “truth” is a battle for power amongst individuals (Nietzsche, 1873).

The language used by invasion biologists and IAS managers plays an important role in facilitating the identification and use of IAS as a scapegoat (Murray, 2005:145). Murray (2005) takes a close look at the imbedded message and, consequently, the language used in IAS campaigns in South Africa, as developed by environmental organisations to educate the public about IAS and gain their support. Considering South Africa’s history of xenophobic attacks, terms such as “alien” and “invader”, which are central to the field of invasion biology, should be used with

caution, as they have the potential to invoke questions of “national belonging”, which underlie the concept of xenophobia (Murray, 2005:137). The inclination for South Africans to associate and subsequently categorise black individuals from other parts of Africa as “alien” or “illegal” (Murray, 2005:140) means that invasion biologists’ use of these, and similar, terms leads individuals in the broader society to maintain these stereotypes, and allows xenophobic rhetoric to thrive (Murray, 2005:137). The semantics of invasion-biology rhetoric invariably depict IAS as “a people” who are aspiring to take what belongs to “us” as South Africans – South African land, native biodiversity, local water supplies and so on. This depiction instils a sense of fear for all that is foreign, and bears a close connotation with non-South Africans coming to “our” country to take “our” jobs (Murray, 2005:140). According to Davis (2000:282), it is the fear of uncertainty associated with all things unknown that people are trying to manage, which leads them to develop stereotypes linked with xenophobic sentiment.

On the other hand, however, such terms can also instil feelings of disgust toward IAS managers for attempting to eradicate IAS, in a translation of the disgust some South Africans feel when they see the atrocities committed in xenophobic attacks against individuals from neighbouring countries (Murray, 2005:140, Sharp *et al.*, 2011:2097). The terms often used in the field of invasion biology conceptualise introduced species as “the enemy” and lead to a situation of “othering”, which places IAS on the outside of the in-group, and creates a sense of detachment between the individual and IAS (Murray, 2005:135). This is an example of how in-group vs. out-group bias, as mentioned earlier, is facilitated. In this sense, the terms that are used by the in-group consisting of “nativists” (scientists, IAS managers and pro-native individuals) are associated with the sentiments of distaste toward the out-group (IAS). Orwell (1956:64) raises an important and often-overlooked aspect of the use of language to express sentiments: by arguing that, “if thought corrupts language, language can also corrupt thought”, he implies that the language an individual chooses to use may influence the way he/she thinks. This notion is supported by Murray’s (2005) results referred to above.

Antilocution seems to be a common trend in the field of invasion biology, in both scientific discourse as well as media communications on the issue. Allport (1954:177) believes that language is used for a reason and it is meant, by the speaker, to have intended effects. Negative words, in particular, are meant to denigrate those they refer

to, and the words often used by scientists and managers in invasion biology are meant to do just that (Parker, 2002; Theodoropolous, 2003:85). With reference to Orwell (1956:64), the words used are also intended to influence the way that individuals think about IAS. Murray (2005:130) provides an example of this when she reveals that, since 2000, invasion biologists in South Africa have taken to the communications industry to bring about a “paradigm shift” in public awareness of IAS, and to ultimately “help sell their message”. The message they intend to “sell” promotes the need to save indigenous fauna and flora from introduced species. This is done by carefully selecting the words that will be used, as well as the presentation of the campaign (Murray, 2005:130). Ultimately, the strategy behind the IAS campaigns in South Africa, according to Murray (2005:127), is to “persuade” members of the public and invoke a change of attitude toward IAS and the way they are managed. This is another way for “nativists” to maintain their power through the influence of words. Larson and Keuffer (2013:256) suggest that caution should be taken in the language used by invasion biologists and IAS managers, as they have the potential to have unintended effects, not all of which involve a fostering of a “pro-native” sentiment.

2.5.3 The construction of a conspiracy theory

Based on much of what has been discussed above, Theodoropolous (2003:90) posits that the theory of invasion biology is nothing more than a conspiracy theory based on an extremist ideology. Kruglanski (1987:228) describes a conspiracy theory as one that is “likely to be believed if it provides welcomes orientation and structure to a group distressed by normative confusion and ambiguity”. This is consistent with the uncertainty inherent in invasion biology, as mentioned above. The need to find a definitive answer, especially under the severe time constraints IAS managers often highlight as inherent in invasion biology, commonly causes one to settle for an “early hypothesis” (Theodoropolous, 2003:90). This, says Theodoropolous (2003:90), leads to the construction and maintenance of a conspiracy rationale, as data are then gathered and interpreted in a way that supports the hypothesis, making them “highly resistant to contradictory evidence”. Kruglanski (1987:220) highlights that conspiracies are not always “gross distortions of reality”, but may take a milder form of cognitive misconceptions that are a result of a reality that has been constructed for

us, in this case, by invasion biologists. Therefore, conspiracy theories can easily fit into the scientific paradigm (Groh, 1987:4) and can be supported by evidence, making them difficult to detect (Theodoropolous, 2003:90).

Although Järvikowski (1996:82–3) and Goldblatt (1996:1–6) caution against using ideas from classical sociologists in the context of human–nature relations and issues pertaining to the environment, as they were not developed with such use in mind, the literature put forth shows societal dynamics that bear similarities to those outlined by early sociologists. Despite the fact that Hannigan (2006:6) and Erwin (2010:15) state that the theory developed by Durkheim are the least relevant with reference to environmental issues, the ideas presented by Theodoropolous (2003) and authors mentioned above could lead one to consider the beliefs of invasion biology as social facts. Durkheim (1982:54) states that social facts are comprised of “beliefs, tendencies and practices of the group taken collectively”. Pressure from these social facts is externally exerted on the public to adopt those same beliefs and to then act and behave in corresponding ways. Theodoropolous (2003) mentions several ways in which this occurs in the field of invasion biology, though the use of legal frameworks, semantics, subjective evidence, extremism, othering and victimisation. The pressure exerted from these factors is often subtle and, unless one is actively looking for indicators, often goes unnoticed. The fear inherent in human–nature relations is taken advantage of by the “architects of invasion biology” (Theodoropolous, 2003:83) and is essentially used to manipulate or coerce individuals into adopting the same beliefs, and therefore adhering to the social facts underlying invasion biology. The reason I refer to these as social facts is because they are sanctioned. With regard to IAS, formal social sanctions are in place: the law, as outlined by the NEMBA Act 10 of 2004 (Republic of South Africa, 2014) stipulates that non-compliance with the regulations put forth by the Act can result in a monetary fine, imprisonment or both. As this illustrates, if individuals do not comply with the external pressure to conform to the beliefs associated with invasion biology, then coercive powers begin to act against them, as is congruent with Durkheim’s (1982:51) thoughts on social facts.

Ultimately, what Theodoropolous (2003) implies – that the threat of IAS is not as bad as we are led to believe, and that “the architects of invasion biology” have made the problem seem worse than in reality – is consistent with the social constructionist approach to environmental issues, such as IAS. There are two common approaches sociologists use to analyse the development of environmental issues – the objective

approach and the social constructionist approach, which will be considered later in this chapter. The objective approach is one that is based on “real, tangible and measurable” indicators, whereas the social constructionist approach asks how people have constructed an issue as a problem, by looking at the claims individuals have made about the “so-called” problem (Macionis & Plummer, 2008:823-824). The basic question is then, how did the “problem” of IAS develop in a just a few decades from being considered a non-problem, whereby the introduction of alien species was thought to be beneficial to the environment, to being a major environmental issue – what claims, and claims made by whom, proliferated this process? Although the purpose of this thesis is not to support or reject Theodoropolous’s hypothesis, I will, however, point out consistencies, if any, between his findings and the findings of my study.

2.6 Collaboration and consensus-based approaches

Daniels and Walker (2001:254) state that environmental conflicts are inevitable, often irresolvable, but manageable. They are inevitable because the public’s right to comment on actions affecting the environment has been widely recognized, hence forms of public involvement in environmental decision making have proliferated, and collaboration between stakeholders has become the preferred approach to deal with environmental conflicts. Often, environmental managers propose this approach, but fall short in terms of its implementation. A collaboration and consensus-based method is defined by Wondolleck and Yaffee (2000:105) as one in which “two-way, interactive flows of information, and decision-making occurs through an open, interactive process rather than behind closed agency doors”.

In this section, two collaboration and consensus-based approaches for managing and resolving environmental conflicts will be discussed in more detail. It is not my intention to put these two models into practice. Instead, I aim to fit two specific conflicts into the models, in order to deduce whether these conflicts have been understood and managed appropriately. The first conflict involves the removal of pine trees in TMNP, and the second conflict involves the euthanising of mallard ducks at Sonstraal dam in Durbanville and Sandvlei dam in Muizenburg.

2.6.1 The collaborative-learning model

As previously mentioned, frameworks to analyse environmental conflicts and public involvement in environmental decision making are an important tool for understanding the dynamics of conflicts, and will be crucial in analysing and interpreting the data collected for this research project. One such framework that has been identified is the collaborative learning (CL) model, which is used to understand environmental conflicts and stakeholder-group involvement. The model is composed of two triads that provide “frames for understanding the messy situations that occur in environmental and natural-resource-management planning and decision making, i.e. the tangle triad and the progress triad” (Walker, Daniels & Emborg, 2008:17).

Walker *et al.* (2008:18) highlight that the tangle triad is defined by complexity, controversy and uncertainty. Environmental policy and natural resource management are considered to be among the most complex parts of the public-policy arena (Walker, Daniels & Emborg, 2008:18). Daniels and Walker (2001:255) provide several roots of complexity in relation to environmental conflict, such as the presence of numerous parties involved; numerous issues at hand; different types of knowledge at play; robust values and perceptions; and legal issues. In some cases there may be a “conflict industry”, whereby individuals may benefit, in a professional capacity, from the existence of a conflict, and therefore may work toward keeping the debate alive, instead of trying to reach a solution (Daniels & Walker, 2001:255). CL is commonly used to highlight whether conflicts are being handled in a way that is appropriate where natural resource management and sustainable development are issues of concern. As far as I could ascertain, on the basis of a thorough review of the available literature, this model has not yet been applied in the analysis of a conflict involving IAS.

Situations of environmental conflict are not only complex, but are also characterised by controversy, as there is seldom only one standpoint in the decision-making process; often, many different perspectives are at play, as suggested by a social constructionist approach (Walker *et al.*, 2008:19). Factors contributing to varied viewpoints, according to Daniels and Walker (2001:255), include culture, history, ethics, and personality, to name a few.

“Consensus is often difficult, if not impossible, to attain due to either varied sources of tension or deeply-held views” (Walker *et al.*, 2008:19), therefore none of

the stakeholder groups can be certain that their views and claims are ultimately correct. The same has been found in the context of South Africa, with regard to consensus regarding ecosystem services, partly due to varying ways in which the concept is understood (Sitas, Prozesky, Esler & Reyers, 2014:1320). Lastly, uncertainty is the final characterising feature of the tangle triad, in that many different types of knowledge are used by different stakeholders in the decision-making process, each originating from different fields. Each form of knowledge, not discounting scientific knowledge, is fundamentally uncertain (Walker *et al.*, 2008:19). It is important that this uncertainty is acknowledged: as Constanza and Cornwell (1992:15) emphasise, uncertainty should be considered an elementary feature of environmental decision making, and should be communicated between stakeholders to ensure all of them are aware thereof.

By addressing the elements of complexity, controversy and uncertainty in environmental conflict and decision making, one is able to identify paths that could potentially lead to progress, growth and quality decisions (Walker *et al.*, 2008:19). Although it is not an explicit aim of this master's study to resolve the conflict that is being researched, such paths have surface during the course of the research and they will be discussed in the recommendation section at the end of the thesis as potential routes to consider.

The second frame for understanding the “messy” situations that occur in environmental and natural-resource-management planning and decision making, i.e. the progress triad, draws attention to where in the process of decision making progress can be made. Conflict and decision making can generally be divided into three components of progress: “content, progress and relationship” (Walker *et al.*, 2008:19). Each dimension of the progress triad is interrelated, rendering unlikely that progress is made in a linear fashion, as progress made in one dimension will directly impact the other dimensions (Walker *et al.*, 2008:19).

The CL model is one of the many models that can be applied to the decision-making process involved in environmental conflict resolution (Walker *et al.*, 2008:20). The model was chosen as a theoretical frame for this research project due to a number of reasons. Firstly, it is particularly applicable to environmental issues involving the public – which, in the case of this study, comprises a large part of the opposition to the removal of pine trees in TMNP – and it therefore aims to further facilitate the understanding the public's perceptions of the environmental issues in

question. It anticipates a large number of viewpoints, and can therefore accommodate differing viewpoints, as well as the respective behaviours brought about by each viewpoint. This is important in the case of this study, as many different opinions regarding pine trees are held. Further, CL strives to combine scientific and local knowledge, and to place scientists and citizens on a level playing field in order to unify them. Lastly, the model strongly emphasises the importance of communication between different stakeholders through “dialogue, argument and negotiation” (Walker *et al.*, 2008:20). A review of the pertinent literature (i.e. Van Wilgen, 2012; Van Wilgen & Richardson, 2012; Epanchin-Niell *et al.*, 2010; Roura-Pascual *et al.*, 2009) suggests that the ecological side of the pine-tree-removal debate is dominant, and it seems that no level platform exists where different stakeholder groups have equal say.

The CL model is diverse in the sense that it can be applied at three levels: philosophy, framework and tactics. For the purpose of this research project, the primary focus will be on CL as a philosophy. As such, CL points out the appropriate objectives that should be pursued when participating in debates within a public arena. It sets out a list of qualities or characteristics that can describe how the researcher will engage with the complexity, controversy and uncertainty of an environmental-conflict situation, and work toward generating improvements and progress within the debate (Walker *et al.*, 2008:21).

The CL model will be used as a checklist to determine whether IAS conflicts concerning pine trees and mallard ducks are dealt with in a consensus-based way. First, the aim of the IAS managers should be to manage the conflict at hand, not necessarily to resolve it. A common misconception is that environmental-conflict models are put in place with the sole purpose of reaching a resolution to a conflict. More often than not, however, the conflict is irresolvable, as emphasised by Daniels and Walker (2001:254), who state that environmental conflicts can rarely be solved, but they can be managed. Second, the diversity and vigour of the different beliefs and perspectives of stakeholders involved must be considered, and should be addressed by engaging these views rather than ignoring them (Walker *et al.*, 2008:21). Third, the notion that success is only achieved when an agreement has been reached should be dispensed with. Reaching a general consensus is rare and should not be used as a measure of success. Fourth, gaining headway in a conflict is an outcome of small and steady improvements achieved by the different stakeholder groups. Expecting progress to be made by all stakeholder groups as one unit is unrealistic; rather, by

asking each respective group to make progress internally and amongst its group members allows them to better identify the areas within their respective group which need improving, and is more likely to generate progress (Walker *et al.*, 2008:21). Lastly, stakeholder groups should be provided with the opportunity to think in a systematic and creative manner. Thereby they would be less likely to hold a “cause-and-effect” view of the problem, and to see it as a “set of interrelated systems” instead (Walker *et al.*, 2008:21).

It is important to reiterate that this research project does not aim to put the CL model into practice, but rather to attempt to fit specific conflicts concerning the removal of pine trees and mallard ducks into the model, in order to determine whether the conflicts have been understood and managed efficiently and adequately. The CL model will be used in conjunction with the trinity of voice (TOV) model, developed by Senecah (2004), which is a three-part model that suggests the criteria that public participation in environmental decision making should meet. By using the CL model first, I will be able to determine which criteria will have to be met if a collaborative and consensus-based approach were to be employed to manage a conflict involving IAS; and by using the TOV model thereafter, it will be possible to determine whether the decision-making processes involved in these conflicts were fair to each stakeholder group, and whether decisions made meet the requirements of a collaborative approach.

2.6.2 The trinity of voice model

The TOV model is centred on the vital role played by each stakeholder in attempts to reach a solution to environmental conflicts, as well as the characteristics of effective collaboration during this process. This allows it to be used as a guide to collaboration and consensus-based approaches. Its stakeholder-centred approach holds the key to an effective participation process, which enhances the lay community’s capacity to better contribute to informed environmental decision making (Senecah, 2004:22).

Three main elements constitute the TOV model. Firstly, all stakeholder groups should have access to at least the minimum resources they need to in order to take full advantage of an opportunity to participate. These include convenient times and places; readily available technical assistance to help them in understanding issues; and continuing opportunities for involvement. Second, all stakeholders should have

sufficient standing, i.e. the level of their legitimacy within a community and the respect, esteem and consideration that all stakeholders' perspectives should be accorded. This is congruent with the list of criteria set out in CL models for effective collaboration and consensus-based decision making. Lastly, each stakeholder group should have an equal degree of influence in the decision-making process; all participants should therefore have the opportunity to be part of a transparent process that considers all possible routes of action (Senecah, 2004:25).

It is important, however, to acknowledge that consensus-based models are not flawless. Although limiting, in that there are many criteria that have to be met, they have emerged as the most appropriate methods for dealing with conflict situations involving IAS (Peterson, Peterson & Peterson, 2005:766). It is promising that environmental managers in the United States are said to be embracing a more consensus-based approach to making environmental decisions, in order to enhance public participation in environmental decision making and conservation (Walker, Senecah & Daniels, 2006:193). However, it is inadvisable to overuse this approach, as it may have dangerous implications for conservation (Peterson *et al.*, 2005:767). For example, Peterson *et al.* (2005:762) argue that this consensus approach is not the most appropriate for maintaining or sustaining conservation goals over the long term, although the approach might have short-term benefits. They claim that a method more firmly grounded in ecology and natural science evidence will yield better results in the long run, as it will accord higher importance to the "environmental agenda", thereby challenging the current power relationships that are based in unsustainable social constructions. In this sense, Peterson *et al.* (2005:762) imply that there is a trade-off between making progress where ecology is concerned and making progress where social aspects are concerned; ultimately, they state that giving consideration to including various stakeholders impedes the ecological success of management. Peterson *et al.* (2005:766) do not claim that consensus-based methods are philosophically weak, but they do assert that those methods are not as practical as they need to be, and that adopting a consensus-based approach will only allow environmental degradation to continue. Consensus-based models may render stakeholders too comfortable with remaining stagnant in negotiations when neither stakeholder group wants to reach a compromise, thereby preventing them from striving toward reaching a consensus. It is clear from their stance that Peterson *et al.* (2005) are concerned with the supposed link between time and environmental

degradation common amongst conservationists. However, Daniels and Walker (2001) state that the chance of a negotiation remaining stagnant is minimal, because all stakeholders are striving for progress to be made, and are therefore willing to reach a compromise in the short term. Short-term action may not be the long-term goal, but it is a favourable option while a framework that moves beyond consensus is being developed.

Peterson *et al.* (2005:766) suggest that, instead of a collaboration and consensus approach, an argumentation model should be adopted, as it places conservation on more sound epistemological ground than social constructionism and consensus-based models, because it is firmly based on scientific facts. Peterson *et al.* (2005:176) posit that the expectations of stakeholders who support public participation in environmental decision making will not be met, because a general consensus is unobtainable, and it is unrealistic to expect that people with different agendas and interests will agree on an issue. The infeasibility of reaching a general consensus, they say, will lead to managers' dissatisfaction with the collaboration process and their desensitisation to the need to involve the public in the long run. However, an argumentation model will reinforce power hierarchies supported and maintained by scientific fact, and will strip other stakeholders of their standing in decision making. This will most likely cause opposition to management actions, because interested members of the public will feel as though their opinions and thoughts have not been given adequate attention in the decision-making process. These feelings of exclusion form the basis for the use of consensus models in environmental decision making (Fischer & Young, 2007:271; Forsyth, Le Maitre, O'Farrell & Van Wilgen 2012:51). Also, in light of the fact that the public has become more educated about nature and the environment (Erwin, 2010:13), individuals with an interest in the way IAS are managed, in the case of this study, will soon become more aware of the power hierarchies at play. Frustration with the system is likely to cause these individuals to resort to the media to get their voices heard, and become more extreme in their opposition actions. This will only serve to further delay management actions.

The current environmental crisis we face today, according to White (1967:1204), is a result of attempts to make environmental decision making a democratic and all-inclusive process. Consensus-based models are philosophically rooted in the social constructionist paradigm (Peterson *et al.*, 2005:762), which ultimately implies that

social constructionism is an inadequate analytical tool within environmental sociology.

2.7 Social constructionism as an analytical tool

Theoretical approaches within environmental sociology can be divided into nine competing paradigms: “human ecology, political economy, social construction, critical realism, ecological modernisation, risk society, environmental justice, actor-network theory and political ecology” (Hannigan, 2006:12). Prior to the 1970’s, it was easy for natural scientists to dismiss social constructionism as a possible school of thought to adopt in the context of environmental research, because social constructionists comprise the minority within a field where positivist inquiry is standard, as it is in the natural sciences (Proctor, 1998:353). The paradigm, however, has become increasingly popular with the emergence of environmental sociology, relating to the attempts of environmental sociologists to bridge the disciplinary divide between the natural sciences and mainstream sociology. At the core of the social constructionist argument is the belief that one cannot view the natural environment as separate and independent of humans (Proctor, 1998:352). Smith (1990:30) strongly supports this school of thought by stating, “nature is nothing if it is not social”. Proctor, a geographer, describes social constructionism, intriguingly, as an “environmental villain” that had entered the positivist territory of scientific inquiry (1998:352). So what is social constructionism, and is it actually as villainous as it is made out to be?

Social constructionism posits that the relationship between nature and society is socially constructed: it is not fixed, and scientific realities are not independent of one’s social context (Newton Deetz & Reed, 2011:9; Proctor, 1998:352). Social constructionism attacks the epistemological core that forms the foundation of positivist inquiry, by positing that scientific facts are not a mirror of reality (Proctor, 1998:3530). In the context of this research, the social constructionist paradigm is adopted as an analytical tool in order to determine how IAS are socially constructed, and how these constructions have led to situations of conflict between different stakeholders on the management of IAS (Fischer & Young, 2007:271). By using a social constructionist lens as an analytical tool in this research, this study will be

considering the claims being made, the people making the claims and the claims-making process, as proposed by Hannigan (2006:64). Hilgartner and Bosks (as cited in Hannigan, 2006:70) note that it is not uncommon for different claims makers to compete for public attention, and this is often effected through a particular choice of rhetoric. As seen in the previous section, the often-controversial use of rhetoric is prevalent in the field of invasion biology and it is one of the ways in which both sides of the conflicts try to gain support.

Some scholars view the grey area between realism and social constructionism as a hindering force within the platform of environmental sociology (Murdoch, 2001:111). Social constructionists and critical realists may agree that how one understands the natural world is mediated through what we experience socially, but critical realists argue that social constructionists have an over-socialised view of nature, stating that too much emphasis is placed on how the “social shapes the material” and not enough on how the “material shapes the social” (Newton *et al*, 2011:9).

Many points of critique have been levelled against the social constructionist approach, in particular relating to its position that no absolute certainty underlies scientific findings, and its neglect to take into account the actual severity of some environmental problems (Hannigan, 2006:31). At the core of this argument is the assumption that the approach does not consider the “reality” of the environmental conditions in question. Social constructionists respond to this critique by using the “uncertainties argument”, according to which one cannot state with absolute certainty that a claim regarding an environmental problem exists purely on the basis of scientific facts (Hannigan, 2006:30). As previously stated, the problem of IAS can be made to seem worse than it is when scientists look for evidence to prove their claims and ignore the evidence that contradicts the severity scientists seek to confirm (Theodoropolous, 2003). Constructionists claim that science has not always proven correct in the past, and to believe that scientific environmental claims are simply correct is naïve. In addition, issues that are at one point in time claimed to be environmental problems may change over time, owing to their historical, spatial and contextual specificity. Many scholars believe that changes over time in the ecosystem are inevitable, and therefore the high level of concern about IAS is unwarranted (Hannigan, 2006:32, Larson, 2007:993). At the same time, however, constructionists do not deny that certain environmental conditions exist and that the threats are real; at

the heart of their argument, however, constructionists warn against simply and automatically rendering a “discussable issue” into an “evident crisis” (Hannigan, 2006:30; Newton *et al.*, 2011:9). Thus, rather than solely documenting the impacts of environmental issues, social constructionism states that the “magnitude” of the impacts are “open to human construction” (Hannigan, 2006:31). Bird explains this notion by suggesting that “[s]cientific knowledge should not be regarded as a representation of nature, but rather as a socially constructed interpretation with an already socially constructed natural–technical object of inquiry” (1987:255). One way Hannigan (2006:32) suggests to minimise the risk of the social constructionist approach undermining an environmental crisis, is to investigate the historical context through which claims have developed, in order to determine their validity. Social constructionists propose that reluctance to accept social constructionism as a valid paradigm within the natural sciences could be attributed to the fact that widely accepted and usually unchallenged facts provided by natural scientists may then be questioned (Proctor, 1998:353).

Despite the objections to the use of social constructionism in the analysis of environmental conditions, Freudenburg (as cited in Hannigan, 2006:29) assures that the analytical tool has fertile and solid ground in environmental sociology and will continue to flourish. However, this, and the argument that it is the most suitable paradigm for the objectives of this research, does not mean that the criticisms against this paradigm should be ignored. In the case of this study I will take this criticism into account when analysing the data, in order to locate myself more neutrally between the opposing views.

More research into the social dimensions of IAS and ecology as a whole needs to be embarked upon if we are to encourage the successful execution of management plans. As such, Peterson *et al.*, (2005:766) suggest that promoting enthusiasm about ecology and conservation through serious debate between scholars across disciplines could push us to discover a solution beyond consensus-based approaches. I believe the research conducted in this study makes a contribution in this regard.

As a point of departure, this study claims that the way in which IAS are socially constructed affects, and in some cases can pre-determine or be used as an indicator to understand or predict, how a conflict is framed regarding the control or management efforts for a particular species. This study is limited in the extent to which it can show how an individual’s social constructions of IAS/particular species have come to be,

but it attempts to decipher what the constructions are. The reason it cannot decipher how social constructions have come to be, is because no consistent longitudinal data were collected regarding the changes in the natural, social and political environment that can influence how the relevant objects are constructed. In my study I have, however, taken note of the significant changes that have taken place, accompanied by a historical outline regarding the species of concern.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter first describes the research design for this exploratory, qualitative case study and in doing so, details the data collection process, how access to the data was obtained and who the individuals were that participated in the study. Next, this chapter discusses the process of data analysis that was followed in the study, and provides a list of the potential shortcomings and limitations of the methodological choices that were made in relation to this study. Lastly, this chapter outlines the ethical considerations relevant to the research, as well as the ethical issues that emerged and how they were dealt with.

Morse and Richards (2002:68) reassure that the relatively high degree of flexibility offered by qualitative research allows for the research design to be altered during the research process, if it is found that the initial design is not generating the data needed to answer the research question. Lincoln and Guba (1985:175), amongst others, support this notion, especially when conducting research in the social constructionist paradigm, by stating that social constructionists aim to uncover details on a phenomenon about which they have limited knowledge, and unearthing these requires a continuous process of fine-tuning of the research design (Barbour, 2008:31; Maxwell, 2013:139).

3.2 Research design: case study

The research design initially chosen for this study was a single case study – a specific conflict between two stakeholder groups concerning the removal of invasive alien trees from the Table Mountain National Park (TMNP). During the early stages of the data collection process, however, it was brought to my attention that another conflict – that of the invasive mallard duck – had emerged, which IAS managers considered as equally important, if not more important, than the pine-tree case. Since the study, as initially conceptualised, did not take into account the aspect of invasive alien fauna, as it focused only on invasive alien flora, it seemed beneficial to the study to include the case of the mallard duck, also because the conflict associated with the mallard duck had quickly escalated to a similar level as that of the pine trees. Investigating whether

the processes involved in dealing with a conflict concerning a fauna IAS is similar to those that apply in the case of a flora IAS will allow the results of the study to be more theoretically transferable to a greater variety of situations. Making use of two case studies in this research would also allow for some comparative analysis between the mallard and pine-tree conflict resolution, and provide some understanding on how conflict issues concerning flora and fauna differ (Remenyi, 2012:23).

There is a trade-off in case study research, described by Chadderton and Torrance (2011:56) as “depth versus coverage”. In other words, the researcher needs to choose between developing a deeper understanding of one instance, as opposed to gaining a fair understanding of many instances; in most cases the “depth” component wins (Chadderton and Torrance, 2011:56). In this study, the depth of understanding provided by the focus on only two instances or cases of conflict between two stakeholder groups, i.e. concerning the removal of invasive alien trees from the TMNP and the removal of mallard ducks, is considered advantageous for exploring these conflicts in rich detail. The depth component is most appropriate for this study, as it allows me to follow a social constructionist approach and to respond to the need for specific historical and spatial contexts within which to adequately understand the claims made.

The case study design requires the use of multiple sources of data (Remenyi, 2012:7; Finnegan, 2006:148), and I therefore collected and analysed three different sources of data – interview transcriptions, research diary entries and documents. The latter included letters to newspapers, national strategy reports, online forums and communications, and other relevant documents that have added to my understanding of the claims that were being put forward by different sets of stakeholders. This will be discussed in further detail later in this chapter.

It is important to note that the case study method, according to Percival and Homer-Dixon (1998:279) who studied the relationship between environmental scarcity and situations of conflict in South Africa, may unintentionally create the impression that there is a positive correlation between environmental scarcity and violence, or in the case of this study, a correlation between IAS eradication attempts and conflict situations, which is not necessarily the case, as many IAS eradication attempts do not give rise to conflict.

3.3 Sampling and gaining access

In keeping with the qualitative nature of this study, two non-probability sampling methods were used to select research participants from whom data was collected: snowball sampling and purposive sampling. Two sets of participants can be distinguished in this study: the first being IAS managers tasked with the removal of either invasive pine trees in TMNP or invasive mallard ducks; and secondly, individuals who oppose the removal of invasive pine trees and/or invasive mallard ducks. The snowball sampling technique was primarily used to select the latter set of participants, as no database or list of these individuals exist, and there was no location where these individuals congregate, making them difficult to find (Babbie and Mouton, 2001:167). Snowball sampling was also used, in the most part to gain access to IAS managers, although purposive sampling was used to select the first individual in this set of respondents.

Purposive sampling was first used to select relevant members of SANParks, i.e. those who are involved in the removal of pine trees from the TBNP. Initially, I intended to familiarise myself with SANParks and its employees, so as to determine which individuals will provide the most valuable data (Denscombe, 2007:17). I started by first applying to register my research project with SANParks, as soon as I received ethical clearance from the Department of Sociology and Social Anthropology's Ethics Screening Committee (DESC) at the end of August 2013. To undertake research involving SANParks, a researcher is required to register his/her proposed study with the organisation. I undertook this step through correspondence with the Science Liaison Officer. During this process my proposed study was presented to the SANPark's Research Committee and Park Management Staff who decide whether permission should be granted to conduct a study.

In response to my application to register my study with SANParks, a manager at the organisation advised me to change the focus of my study, citing concerns about the similarity between my proposed study and an ongoing PhD study that the individual was aware of. The manager also urged me not to focus on the conflict involving invasive pine trees because, as quoted verbatim from a personal communication, "the debate has moved on". I consulted my supervisor about the issue and decided to make a few minor changes to the scope of the study. Two months later, SANParks was satisfied with the changes I had made and agreed to participate

in the study in February 2014. During my correspondence with SANParks regarding their previous concerns, I became familiar with one of the members of staff. She suggested we have an informal discussion about how to best proceed with the study, and the discussion was treated as an interview (with her permission), as she provided valuable information about the conflict concerning the removal of pine trees in TMNP.

After the interview, she provided me with the email addresses of three other members of SANParks, as well as the names of two individuals outside of SANParks, who would be valuable sources of data for the study. This was the point of departure for the snowball sampling method with regard to the IAS-manager set of respondents. During each interview I conducted with IAS managers, I asked whether they knew of any other individuals who would be valuable participants in the study, and if so, whether they would provide those individuals' contact details. In the two instances where the names of individuals were given without any contact details, I used Google to acquire their office numbers. When making initial contact with the suggested potential participants, I informed them that they had been suggested as a potential participants, but only provided the names of those who had suggested them if I had been given the permission to do so. If no permission had been given, I simply stated that they were suggested by someone who wishes to remain anonymous.

One of the participants that was suggested to me is not an IAS manager, but was originally an environmental journalist who now plays many different roles in the field of invasion biology in South Africa. This participant is known by IAS managers as the most appropriate individual to contact when a conflict arises, and is considered by many environmental institutions in Cape Town as their most valuable human resource when diffusing conflicts involving IAS. I included this participant in the IAS-manager sample, as the individual does not oppose the removal of either pine trees or mallard ducks, but rather supports the initiatives.

Since the set of respondents who oppose the removal of pine trees and/or mallard ducks are difficult to locate, I asked employees of SANParks and other organisations relevant to this study, such as City of Cape Town and smaller environmental organisations and groups, if they would be able to provide contact information of people who have sent them complaints regarding the removal of pine trees or mallard ducks. However, as there were some concerns regarding the legal implications of doing so, a different approach to locating these potential respondents was suggested

by the IAS managers, i.e. that I spend some time at specific sites that are often the source of complaints, as I would be most likely to encounter the desired potential participants there. I was provided with two locations where I could possibly find individuals opposing the removal of mallard ducks, and one location for those opposing the removal of pine trees.

All three of these locations were large areas and were mostly used for recreational purposes. I visited these areas on the weekends, as this was a time that most other people also did so. I approached the individuals I encountered and initiated casual conversations with them. Once I was able to ascertain whether they had an interest in preserving mallard ducks or pine trees, I informed them about my study and asked whether they would be willing to take part in the research, emphasising the fact that their participation was completely voluntary. I also took care to inform them that I was conducting research as a student affiliated with the Stellenbosch University and with my respective department, as suggested by Olsen (2012:91). I also assured them that I was not working in collaboration with any of the organisations concerned with the control or removal of mallard ducks or pine trees.

A few of the individuals opted not to take part in the study, for reasons most commonly related to a lack of time to participate in an interview, a lack of knowledge on the subject, and/or not having a particular reason to oppose the removal of the species in question. Six individuals agreed to participate in the study and were also able to suggest people they know who share their sentiments on the subject, and the snowball sampling method was used from that point onwards.

As it is proved quite challenging to find individuals who oppose the removal of mallard ducks or pine trees in Cape Town, I also utilised Facebook as a social media platform to identify potential participants. At first I used search strings such as “save mallard ducks”, “save pine trees in Cape Town”, “save invasive species in Cape Town”, “save the pines”, and the like. These search terms were not very successful in yielding desired results. I then simplified the search strings to only “mallard duck”, “pine trees”, and “invasive species South Africa”. All three sets of search terms produced similar results, the majority of which were posts in which these terms had been used.

I had initially hoped to find interest groups with members opposed to the removal of mallard ducks or pine trees; instead, I found interest groups that provided much educational information about mallard ducks in Cape Town, and there were no posts

that opposed or favoured the removal of pine trees in Cape Town. The information on mallard ducks included pictures to show the difference in appearance between a mallard duck and the indigenous waterfowl in the Western Cape. The posts also included pictures showing the population distribution of the mallard ducks in South Africa, in comparison to that of indigenous ducks (see Addendum 1). I examined the comments made on these posts to determine whether they had been posted by individuals who oppose the efforts of the interest groups concerned with promoting education on mallard ducks. I encountered one post in which a few opposing comments were made, and considered contacting, via the inbox option on Facebook, the individuals who made the comments. However, for reasons discussed in more detail in the ethics-concerns section of this chapter, I decided not to invade the privacy of the individual by contacting him/her directly in this manner, and chose to contact the individuals that the group administrators suggested, as these are the members that are most persistently active in the group.

When contacting an interest group on Facebook, I identified the members tasked with the administration of the group (listed under “Admin”), to whom I would then send an email. The email outlined who I am and what the aims of the study are, and asked whether the administrator would be willing to participate, or know of anyone who would be willing to participate in the study. After receiving a response from a group administrator, I enquired whether he/she would allow me to post a message on the group wall, which would be visible to all members. The decision to allow me to post a message in the group, or to suggest possible participants to me, was left to the discretion of the group administrator, and I assured them that I would not write a post if this went against their and/or the group’s wishes. A template of the initial email and subsequent request has been provided in Addendum 2.

One of the group administrators I contacted showed much enthusiasm about the study, and included in his response e-mail to me the names of three of the group members that, according to him, would be valuable participants in the study. Each of the participants he suggested agreed to participate, and provided their private e-mail addresses via which I contacted them from that point onward. This particular interest group, sourced from Facebook, is part of an environmental organisation in Cape Town tasked with aiding the City of Cape Town municipal body with management of certain areas in the city. This organisation is under the mandate of the City of Cape Town, and they are tasked with managing various demarcated locations around the

city. IAS management falls within the scope of their duties and they support the drive to control and remove (where possible) biological invasions. I will not be including the name of the organisation, as they have asked to remain anonymous in the reporting of the data.

A total of 21 individuals participated in this study, ten of which are part of the IAS-manager sample, while the other eleven oppose the removal of pine trees and/or mallard ducks, as shown in Figure 1 below.



Figure 1: The number and category of individuals who participated in the study

3.4 Data collection

Three different types of data sources were utilised for this study: in-depth, semi-structured interviews, my entries in a research diary (interview notes, field notes and observations), and existing documents, such as newspaper clippings, websites, policy documents, online forums and communications, all of which are available in the public domain.

In keeping with the qualitative nature of the study, I collected the majority of my data through the use of in-depth, semi-structured, individual interviews with two sets of research participants. In order to answer the research questions this study aimed to address, a constructionist paradigm guided the gathering of these data. Interviewers from a positivist background would acknowledge that the setting of the interview, and the way in which the interviewer and interviewee interact, are important elements to take note of. The difference between a constructionist approach and a positivist approach is that the latter involves an attempt to control those elements in order to collect uniform sets of data, whereas constructionists view these elements as contributing to the social reality of the knowledge produced in the interview (Marvasti, 2004:17). In this study the constructionist approach to interviewing was

taken, as collecting uniform sets of data was not the main aim. The research diary, explored later in this chapter, captures details of context and the nature of interactions between the researcher and the respondents.

3.4.1 Qualitative interviews

This study makes use of in-depth, semi-structured interviews. Johnson (2002:106) states that in-depth interviews set out to uncover “perceptions, explanations, and understandings” of an experience that the respondent has had, and the purpose of this method is to “explore the contextual boundaries of that experience or perception, to uncover what is usually hidden from ordinary view or reflection or to penetrate to more reflective understandings about the nature of that experience”. This method of data collection was therefore considered most appropriate to yield the data needed to answer the questions this study sets out to investigate.

Marvasti (2004:21) states that in-depth interviews have the potential to bring about a mutually beneficial outcome for the researcher and the participant, in that such interviews could allow the participant to spend some time clearly thinking through something they may not otherwise have given any in-depth thought to, and this may uncover feelings they had been unaware of. In-depth interviews also provide a multi-perspective understanding of the topic concerned, according to Johnson (2002:106), as participants are not limited to selecting pre-designed answers, as is the case in quantitative approaches. In this way, there is scope to uncover many, and sometimes contradictory, viewpoints that are beneficial to a study of this nature.

Marvasti (2004:21) highlights, as one of the main advantages of in-depth interviews, the fact that participants are unable to hide behind the comfort of an “it depends” approach. Participants are given the time to think beyond “it depends”, and are more likely to at least provide one opinion, if not delve deeper. “It depends” is a common response when quantitative data collection tools are used, as it is an easy and convenient answer that does not require much time or thought (Marvasti, 2004:21). Participants were all given time to reflect or given the option to return to a question when they were unsure of an answer or how they felt about an issue that was raised. This was beneficial to this study, as it added to the richness of the data because participants were given the opportunity to determine how they truly felt about issues the questions were addressing.

In this study I opted for the in-depth interview method rather than the ethnographic interview method, as the latter places much importance on the context of the physical setting of the research field. On the contrary, I chose and visited those research sites at which I was most likely to locate potential participants, and not because of the context of the site itself, and I placed more emphasis on the context of the interaction. Although some of the interview questions do refer to a particular site or area, the importance is placed on the species in that area than the area itself (Marvasti, 2004:22).

It is becoming increasingly popular amongst social researchers to move beyond the traditional “give-and-take” boundaries of the question-and-answer format of an interview (Marvasti, 2004:29), so when I was asked a question by participants, whether related to the study or not, I obliged them with an answer, taking care to remain as neutral as possible with regard to the study topic, so as not to influence their perceptions or attitudes. I opted in this study for the format of a conversation, rather than a one-sided interview, to ensure that participants felt comfortable. Since the interviews took the form of a discussion, I was asked questions by the participants in all but two of the interviews. When the interviews came to an end and the voice recording had stopped, some participants had a few questions of interest pertaining to the study and motivation underlying it. .

Most of the interviews were conducted face-to-face, with the exception of two that were conducted telephonically, as one of the participants was not in Cape Town at the time of data collection, and the other preferred to be interviewed telephonically because she felt more comfortable being at home during the interview and didn't want me to have to drive approximately 40km to meet them there, even though I had expressed my willingness to do so. Generally, interviews were conducted in a location that best suited the participants – some preferred their place of work, some the comfort of their own home, and others a public place over a cup of coffee – while a few participants were interviewed at one of the sites mentioned in the sampling section of this chapter.

Once I had introduced the study and established a good level of rapport via email communications or face-to-face interactions, I requested the participants to read and sign an informed consent form (see Addendum 5). I then asked the participants whether they would feel comfortable if I recorded the interview. If a participant was unwilling to accede to this request, I took handwritten notes during the interview.

Once the interview commenced, I took care not to assume a dominant role in the interaction, and therefore allowed the participants to digress slightly from the study topic when they were trying to get their point across, instead of interrupting and steering them back to the focus of the study straight away. In the instances when it became clear that a participant was discussing issues completely beyond the scope of the study, I subtly directed the conversation back to the question that was asked.

In accordance with Barbour (2008:115), I began by asking the more general questions at the beginning of the interviews, whilst building rapport with the respondent. This study is categorised as low-risk in terms of research ethics, as the questions are generally not considered to be of a sensitive nature, and the likelihood of respondents being made uncomfortable by the type of questions asked is low. All of the interviews ended on a good note between myself and the participants, and I provided them with a brief review of their main points or arguments, to ensure that he/she agreed with the data I had recorded and that he/she had the chance to point out if something was left out. This process is encouraged by Kvale (2007:31) in order to maximise accurate reporting of the knowledge produced by the interview.

To further increase the quality of my data, I ensured that my full attention was given to the respondents and the answers they provide during interviews, as suggested by Morse and Richards (2002:89). This was, however, challenging when respondents veered off from the question at hand and began to talk about issues unrelated to that question or to the study as a whole. In these instances I found it helpful to write down key words relating to the direction the interview was taking before it deviated, so returning to the initial question was less onerous. When the interviews veered beyond the scope of the questions, I tried to bring the discussion back to the topic, as suggested by Olsen (2012:45), but I did not disregard what was said; in fact, in some cases diverging from the interview schedule led me down fruitful avenues relating to the study I would not have been exposed to otherwise.

As soon as an interview had been concluded, I jotted down as many notes about it as I could in my research diary (which is described in more detail below). These notes recorded as much detail about the interview as possible, as some of the detail, such as body language or attitudes, does not come across in the voice recording. Making use of an audio recording allowed me to pay attention to these other elements during the interview (Lindlof, 1995:209). Recording as much of these non-verbal elements on paper before forgetting the detail was therefore most crucial for the two interviews in

which the respondents did not allow me to use a voice recorder. In total, 21 in-depth, semi-structured interviews were conducted from March 2014 to November 2014. The duration of the interviews ranged from 28 to 84 minutes, averaging 48 minutes per interview.

Although I had initially intended making use of the focus group method in combination with individual interviews, it was not possible to assemble the respondents in the same place at the same time to conduct focus group interviews. In July 2014, I attended a symposium on the management of invasive alien plants, at which I had hoped six or seven IAS managers would participate in a focus group interview, but this was not possible, as the activities of the symposium took up most of our time, and many of the attendees had scheduled meetings during their free time. In addition, the symposium brought together IAS managers from all over the country, while my aim was to focus on IAS managers who manage sites in Cape Town specifically.

3.4.2 The research diary as an aid

Research diaries have been used across disciplines for many years. The original purpose of a research diary, according to Altrichter and Holly (2012:43), is to record data gathered from “key informants” and during the use of the participant observation method. In a research diary, one can expect to find various components, such as field notes taken during and after interviews with participants; items that the researcher comes across during the research process, such as websites and newspaper clippings; information about the research methods that were used and reflections on those methods; and lastly, ideas about future research avenues and potential ways in which one could improve the study (Altrichter & Holly 2012:44). My research diary also included short paragraphs from academic journals or books that I found interesting or thought would be applicable to my research; notes from lectures, seminars and workshops that I had attended; and extracts from conversations with people I spoke to in passing, but who were not formally interviewed for the study. Altrichter and Holly (2012:44) refer to these as “miscellaneous entries”, which could otherwise be lost or misplaced if not recorded in, for example, a research diary. In this way, a research diary can take on the role as a researcher’s confidante, and can show how the researcher developed different perceptions during the research process (Altrichter &

Holly 2012:44). Indeed, I found that during the interview process my perception would alter slightly at different stages of the research process. When I interviewed some of the IAS managers, I found myself sympathising with them concerning the difficulties, barriers and day-to-day struggles they face in their strive towards effective IAS management, one of which being public opposition in a context characterised by time constraints. When I interviewed individuals who oppose IAS management, however, I found myself sympathising with their desire to feel included in the management process.

The amount of data I recorded in my research diary varied over time. During the time interviews were being conducted, I usually recorded data in the diary 5 or 6 days a week, and sometimes even a few times a day. During the time between interviews, when I was usually occupied with transcribing the interviews that had already been recorded, I referred back to the research diary, in particular to the notes I had taken during interviews with respondents, to determine whether I needed to add anything to the transcriptions from those interview notes.

I also made more frequent use of the diary during the writing up of Chapter 4 (results) and Chapter 5 (discussion). Again, this involved primarily referring back to the information I had already recorded in the diary, as some of these data were results that I had recorded during the course of research; in the diary were also some interpretations of the data that I had recorded in passing. I found the “miscellaneous entries” very helpful during the writing up of most of the chapters, because there were important articles, websites, observation notes, and other miscellaneous information from respondents that all contributed to various chapters in the thesis.

My research diary was also used to record my reflections, as a researcher, about my experience of the research process. Something that became apparent was that I wrote very positive and enthusiastic entries during times that I was conducting interviews and attending workshops, seminars or other events related to my project, such as the SANParks Park Management Plans meeting. Outside of those times, I found the entries to decline in number and level of enthusiasm. I noticed a correlation between the level of enthusiasm of entries and my productivity at the time: the more enthusiastic the entries, the more productive I was, and vice versa. Altrichter and Holly (2012:45) suggest that recording entries regularly can promote more efficient use of a research diary, and during this study I found this to be the case. Amid periods when entries were recorded more frequently I found that they were of higher quality

and contained information more pertinent to the study than entries made at other times.

Since there were many different types of entries in my research diary that were not always entered in chronological order, it was somewhat challenging to link and order the entries when reading through them. This compounded the difficulties I encountered when trying to find the entries that related to what I was analysing or writing up at the time. Locating relevant entries was therefore time consuming, but the resulting data were valuable. In retrospect, it may have helped to review the research diary more often, in order to become completely familiar with the content. As Altrichter and Holly (2012:46) suggest, I found it helpful to revisit previous data entries regularly, as it maintained my focus on the research questions and prevented me from straying beyond the scope of the study. During times when I did not regularly revisit data entries, I found that many of them veered slightly off from the focus of the study, rendering me vulnerable to the “data overload” that can occur in such instances (Altrichter and Holly, 2012:46).

Keeping a research diary also allowed me to reflect on my own thoughts, perceptions and assumptions during the research process, as well as to determine whether and how they changed during the process. Such reflection is important, as one’s thoughts, perceptions and assumptions may have some bearing on the way the research is conducted, or the way in which the results are interpreted. By giving some consideration to these reflections in the presentation of the results of the study, I aimed to increase transparency and lessen bias in the thesis.

3.4.3 Documents as data sources

Newspaper articles were acquired using SABINET’s SA Media database of South African newspapers, accessed via the Stellenbosch University library website. Standard search terms were used, such as “invasive pine trees”, “mallard duck”, “invasive species” and “invasion biology”. The majority of the search results comprised articles concerning some conflict or argument between stakeholders regarding the respective species. However, a few articles commended the efforts of IAP managers for their success in removing or managing a species. As part of my data collection strategy, I joined a mailing list of a group comprised of individuals who are enthusiastic about the control and removal of IAS. The group sent out regular

emails about major developments on the topic of invasion biology in South Africa. The content of the emails related to NEMBA regulations, new IAS that have been added to the invasive species list, and sometimes (in five instances) a newspaper clipping regarding an issue at hand would accompany the e-mails. Policy documents, such as the NEMBA Act 10 of 2004 (Republic of South Africa, 2014), were not used as a source of data, but were only consulted as background information.

Data were also collected from online fora in the public domain, where the management of invasive pine trees or mallard ducks in Cape Town were a topic of conversation. This was a time-consuming task, as fora such as the SANParks online forum concern the conservation and management of protected areas and not specifically IAS management, which required me to sort through a large amount of non-relevant information. Information that required sorting included that found on the social media site, Facebook, as mentioned earlier in this chapter. Finally, data were also collected from the public websites of interest groups and environmental organisations. In all cases I ensured that no copyright applied to any of the data collected from documents for use in the study.

3.5 Data processing and analysis

In line with Lindlof (1995:215), the analysis of the qualitative data generated in this study was treated as a process that continued throughout the duration of the study, rather than taking place once all the data had been collected. The approach taken to data analysis was not as linear as it is presented in this report; rather, the process took on a cyclical nature and the data collection, transcription, coding, and interpretation of the data occurred simultaneously, although not at the same rate. Lindlof (1995:215) suggests that this cyclical process is a common feature of data analysis in qualitative studies. The flexibility of qualitative research allowed me to begin a preliminary analysis as soon as I began to take field notes or record entries in my research diary (Lindlof, 1995:215).

I transcribed all interviews, in order to maintain uniformity and quality of the data. During the transcription process, all interviews were transcribed from an audio recording into a textual format in a Microsoft Word document. A pseudonym – usually in the form of a number – was used to name the Word document and the same

pseudonym was assigned to the corresponding audio recording, as suggested by Olsen (2012:39). Care was taken not to get the pseudonyms confused, in case a Word document had to be traced back to the relevant audio clip to verify something, if the need presented itself. All transcripts are verbatim representations of the interviews, even if an interview strayed from the relevant topics. By means of different-coloured highlights, clear distinctions were drawn in each document between the voice of the researcher and the voice of the respondent. Capital letters were used when the respondents placed particular emphasis on something. The interview notes written in the research diary during the interviews were included in the transcripts, where they applied. Lindlof (1995:212) suggests that including interview notes and field notes that were taken is helpful with regard to data analysis, and can add significantly to the richness and quality of the data. I found the inclusion of these notes helpful, as they accounted for certain changes that took place during the interviews. For example, I was conducting an interview at the Sandvlei Dam, which had proceeded well until the respondent was greeted by an acquaintance mid-interview. The mood of the interview changed from that point onward, and the respondent's answers became very short and straightforward. During the transcription process, I was able to account for the change in the flow of the interview, as my notes stated that the respondent's acquaintance remained in close proximity and the respondent seemed somewhat anxious and kept looking over her shoulder. In this case, the respondent appeared uneasy with the possibility of someone hearing her answers and thereby knowing her stance on the issue of mallard duck management.

The time was noted at two-minute intervals, or as close to two-minute intervals as possible, on the Word document. Considering the length of the interviews conducted, this was a precautionary measure taken to allow me to return back to a specific point in a recording to verify something in the transcription, or to analyse the tone of the interview at that point. In this manner, returning to different points of the recording could be done more efficiently, and less time was wasted doing so.

3.5.1 Analysis of the interview and research-diary data

Once data collection had commenced and the number of interviews and subsequent transcriptions began to increase, I began to sort or categorise the data. I started by colour-coding the data by highlighting different categories of data in different colours. The sorting began at a more general level, with only a few categories at first. As time progressed, the number of categories grew, and some categories were subdivided to produce categories within categories. As it became increasingly difficult to manage the data as the number of interviews conducted proliferated, I produced different Word documents for the different categories and subcategories, thereby including in one Word document all the interview data that fit into one (sub-) category. I also developed a numbering system according to which I assigned a unique number to each respondent. In the category-specific Word documents, I then recorded the number of the respondent who produced the data, thereby allowing me to keep track of who said what with regard to a specific category. I managed the files on my laptop by creating a folder for each category, in which I saved the respective Word document(s), as well as sources of literature containing theory relating to a specific category, thereby making it easier for me to analyse a variety of different categories. This process is consistent with that prescribed by Boulton and Hammersley (2006:53) for the analysis of unstructured qualitative data. I made sure to keep an original, unaltered copy of each transcription, in case it emerged during the research process that a mistake had been made at the more general level of the categorisation process. I also kept a copy of a categorised version of each transcription, so that I could retrace my steps if I noticed a mistake in a categorisation or interpretation, instead of having to return back to the original version of the transcription.

After I had transcribed all the interviews and sorted them into categories, I began to convert the data from my research diary to a digital, textual format, to allow me to save extracts of these data in the relevant category-specific folders. Once the transcription process was complete, I began to sort the data entries from my research diary into the different categories they relate to. In most instances I was unable to include a time reference for the data from the research diary, as most of the entries were not entered in chronological order. I therefore found it effective to work on one category-specific folder at a time. However, the same data were sometimes included in two separate category-specific folders, as they could be related to more than one

category, and in these cases I worked on more than one category-specific folder at the same time. In this way, the large volume of generated data was categorised into smaller, organised compartments, each containing all the data and theory related to a single category. If I found something in one category-specific folder that had some relation to another concept or category, I copied the information to the relevant folder, along with the respondent reference number. Once all the data had been sorted through and were assigned to the appropriate categories and sub-categories, the process of interpretation began, which related the results generated to the relevant empirical and theoretical literature.

3.5.2 Analysis of documents

Scott (1990) devised a set of criteria against which social researchers can assess the quality of documents as a source of data: authenticity, credibility and representativeness. Researchers should first ensure that the documents they source are authentic and are what they claim to be. It is important that the information contained in a document is not distorted, but it is difficult to ensure this, as information is almost always distorted in some way due to the different ways individuals can describe a social reality according to how they have personally constructed it. In this regard, a researcher must gauge how genuine an author's account of his/her social reality is, and if the author believes what he/she is recording. It is also up to the researcher to decipher whether documents are representative of the sum of applicable documents. This is again not an easy task, as some documents conveying a different view point may not be shared in the public domain to which the researcher has access. Lastly, researchers must ensure that the documents are both unambiguous and easily understood. Finnegan (2006:148) points out that when using news media as a source of data it is important to acknowledge that media channels tend to focus on the more controversial aspects of stories that will attract the most attention, rather than report on the mundane facets of a story.

Therefore, the fact that documents were sourced from newspapers is considered to be highly relevant, as newspapers intend to inform the public of the situation of the management of pine trees and mallard ducks, and they are also intended to reach a large audience. They inform the public of the debate and provide them access to the debate, in order to engage with the discourse. The documents analysed in this study

were letters to newspapers, online communications and a national strategy report. The documents were analysed in a similar fashion to the interview data. I began by reading the documents and extracting information related to the study. I then entered that information verbatim into Word documents and saved each under a pseudonym which corresponded to the pseudonym given to the original document from which the information was sourced. The same steps were then followed as in the analysis of interview data: the data were sorted into main categories which were then divided into sub-categories until all the data had been categorised accordingly. Then began the interpretation of the data gathered, according to the relevant categories.

It is generally recognised amongst social scientists that “all human formulations are inevitably shaped by the social and cultural contexts in which they are created, and by the individuals or collectives who create them”, as is consistent with the social constructionist paradigm (Finnegan, 2006:147). It is important to acknowledge that interpretations may vary between researchers and, as Finnegan (2006:149) points out, documents may therefore be understood in a certain way by one researcher and in a different way by another. My interpretation of the documents used in this study may therefore affect the results generated by the study.

3.6 Shortcomings and potential limitations

One of the downfalls of using in-depth interviews as a data collection method is that it is very time-consuming, and allowing an interviewee to go off at tangents (Bryman, 2012:470) that are not necessarily related to the study renders the transcription of those interviews quite an arduous task. Conducting and transcribing all of the 21 interviews myself was very time-consuming, although I believe it promoted the reliability of the data generated in the study.

During the two years I spent conducting this study, two A5 research diaries comprising 96 pages in total were filled. This constitutes a lot of information, not all of which was recorded in chronological order. Marking entries with different colours according to different categories of information they related to, would have been a useful strategy and something to consider in future research endeavours. Altrichter and Holly (2012:45) suggest that recording entries regularly can promote more efficient use of a research diary. The fact that entries were sparse during certain times

in the course of this study, as previously mentioned, may have had an effect on the efficiency of the research diary in this study, and important information may have been missed during these times. Not writing in my research diary every day or regularly is a potential shortcoming of the study.

In terms of using Facebook to recruit potential participants, I did not directly approach the Facebook users who had made posts that oppose the removal of mallard ducks. I did not find any individuals who had made posts about pine trees during my searches. It is possible that these posts had been removed prior to my search.

3.7 Ethical concerns

Given the relatively non-sensitive nature of the topic of this study, and the low level of vulnerability of the participants, it was categorised as “low-risk” by the Department of Sociology and Social Anthropology’s Ethics Screening Committee (DESC). During the data analysis and presentation of results, I adhered to my ethical obligations towards both the participants as well as the scientific community as a whole, as suggested by Babbie and Mouton (2001:526). I did not change any data, nor did I fabricate results. I have also indicated above the limitations and shortcomings of this study, and how these may affect the validity of the findings.

During the course of this research, I was faced with a few ethical issues. The first involved the formal, written institutional permission that I was required to attain from each organisation that employed the IAP-manager participants. Due to the lengthy and complicated process of gaining permission from their respective organisations, many of those who agreed to participate requested that they be allowed to do so in a private capacity.

I addressed the issue by requesting the IAP-manager respondents who wished to participate independent of their organisation, to sign a letter of consent (see Addendum 5) stating that they have been asked to participate in the study, that they have been made aware of the process of their participation and that they agree to participate in their personal capacity. In three instances the respondents did not sign and return the letter of consent, and yet the interviews went ahead as scheduled. In these instances I returned to our email communications in which I had introduced myself and the study in some detail and in which the respondents had communicated

their willingness and consent to participate in the study. I printed out these communications and filed them as proxy letters of consent.

Since the snowball sampling method was used in order to build a sample of IAP managers, I was referred to each participant by being provided his/her name and contact details; and since I personally interacted with each of the public participants, their identities were known to me. Great care was therefore taken to ensure that all the information provided by the participants in both samples remained confidential throughout the research process, and anonymous in the final report. However, I could not ensure the anonymity of the members of the Facebook interest group that I interviewed, because the group administrator cc'd the respondents in one e-mail, and each of the respondents openly stated in the e-mail that they were willing to participate in the study.

I did not formally, in writing, request the Facebook group's permission to conduct research with the members of the group, as they were represented on Facebook as an interest group open to anyone with access to the social media site, and did not constitute a formal organisation. I did, however, ask the group members who participated in the study to sign an informed consent form, the same as the other participants in the study were.

I did not request institutional permission from the other well-known organisation tasked with the removal of both pine trees and mallard ducks, as members of this organisation themselves urged me against it, on the basis of the large amount of timely and difficult process involved and that, consequently, it would take months to be granted. They suggested, instead, that they each participate in the study in his/her own personal capacity as an IAS manager. I agreed to this, and ensured that they signed informed consent forms as the other respondents did, and that the same steps were followed in doing so.

With regard to the use of social media platforms as a way to locate potential respondents, I grappled with the element of privacy associated with a social media network such as Facebook. The notion of privacy proposes that each individual is at liberty to decide what is known about them by others, as well as how much is known (Elm, 2009:69). In this sense, the information they choose to disclose themselves is what they are comfortable with others knowing. The topic of privacy is crucial in the research sphere, and translates into the issue of informed consent, whereby each participant should give knowing permission to being studied (Elm, 2009:70). It is

generally considered bad practice to collect research data without any form of informed consent. However, there appears to be consensus within the field of research ethics that data can be collected without informed consent if the environment through which it is collected is public (Elm, 2009:73). This raises the issue of what is commonly termed as the “public–private dichotomy” (Elm, 2009:73). Elm (2009:74–75) cautions against the notions of public and private as dichotomous, and suggests they best be thought of as located on a continuum, owing to the differing degrees of public and private. Elm (2009:75) proposes four categories that represent how public or private a research environment is: “public, semi-public, semi-private, and private”. The social media network, Facebook, which was used in this study, can be considered a semi-public environment, according to Elm (2009:75), as “it is in principle accessible to anyone, but it first requires membership and registration”. Facebook has added features that allow its members to edit their privacy settings in accordance to how accessible they would prefer their information to be.

Despite the seeming ease with which one can place a research environment in a public–private category, researchers are still faced with issues concerning the privacy of Internet research, namely how accessible a site is, and how private or public the users think their online contributions are (Elm, 2009:77-78). With these questions in mind, it is left to the discretion of the researcher to draw a conclusion as to which aspects of a site are public, and which are to be considered private. Elm (2009:78) suggests a way to better distinguish between the public and private aspects, i.e. to compare the online research environment to an offline equivalent. For the semi-public category, Elm (2009:78) recommends a library as an offline equivalent. To conduct observations of interactions between people in a library, one would need to gain the permission of the library, but would not need to acquire informed consent from every individual observed. If the researcher would like to interview an individual in the library, however, informed consent from the individual would then be required. This approach was used in the research conducted on Facebook.

Permission from the group administrators was acquired before any observations were made, and in the case to the four interviews that were conducted with members of the groups, individual informed consent was obtained from each respective individual. I found Elm’s (2009:78) recommendation to equate online and offline environments to decipher where Facebook is located on the public–private continuum very helpful. I decided to contact the members who were suggested to me by the

group administrators, as these were the individuals who were most active in the group.

All digital voice recordings were kept in a password-protected file on my personal laptop. The digital versions of the transcribed interviews were saved in a password-protected folder on my personal laptop, as well as on my personal, external hard-disk drive and a flash drive. The external hard-disk drive and the flash drive were kept in locations to which there was limited access. The hard copies of all the transcribed interviews were kept in a locked desk drawer to which only I had access. The hard-copy letters of consent signed by the respondents were kept separate from the transcribed interviews, making it impossible for anyone to link the identity of the respondents to the interview data.

With regard to the use of documents as sources of data, ethical considerations do not bear much relevance. In the case of media articles it was, instead, the responsibility of the journalists who compiled the data to ensure that they complied with their profession's ethical codes and regulations when they were interacting with their sources and communicating their message. The other documents were obtained from the Internet in domains that can be freely accessed by the members of the public. It was, therefore, the responsibility of those who generated and compiled the data to adhere to ethical guidelines and regulations.

All potential respondents were informed that their participation in the study was completely voluntary and that there would be no negative implications if they chose not to participate. I took care not to make potential respondents feel pressurised to participate in the study or to respond to all the questions asked in the semi-structured interviews. Each participant was informed that they could withdraw their participation in the study at any time, if they wished to do so.

3.8 Conclusion

This chapter has described and justified the choice of research design for this study. It has also provided some insight as to why different methods were used, showing how they add to the study with reference to generating data appropriate to answer the questions posed in this study.

CHAPTER 4 – RESULTS

4.1 Introduction

This chapter has three primary objectives. First, it addresses the question of what procedures and frameworks are in place to handle conflicts that arise regarding the management of IAS in Cape Town. In this regard, I outline the steps taken by IAS managers from the onset of conflict to the point at which an agreement or solution is reached, and identify the various stakeholder groups involved in the process. Next in the Chapter, I list and describe the types of conflict that one can encounter when dealing with IAS management, providing examples of and how they develop. Lastly, this chapter reveals the reasons why conflict regarding the management of IAS has developed, and continues to persist in Cape Town, particularly where pine trees and mallard ducks are concerned.

4.2 Procedures and frameworks for dealing with IAS conflict in Cape Town

An important aim of this study was to investigate whether the existing processes of public involvement in conflict-resolution processes are in line with well-known collaboration and consensus-based methods. In light of this aim, each IAS manager interviewed was asked to describe the procedures and frameworks that are used when encountering and dealing with a conflict regarding the removal of an IAS. It was surprising to learn that there are no formal procedures and guidelines in place to deal with conflicts. IAS managers explained this by arguing that, since many of the conflicts arise due to the unique set of circumstances associated with each specific case, it would be difficult to devise a one-size-fits-all framework that can be used in every instance. Also mentioned in this regard was that, although South Africa is seen as a pioneer in the field of invasion biology, the country is still in a “learning phase” concerning the conflict IAS managers encounter in their effort to manage IAS.

4.2.1 Learning what works

Despite the lack of formal procedures and frameworks, a template is used as a starting point for management plans at every site. This template is used to record all the problems with the site, all the issues regarding IAS on the site, and all the stakeholders – those both directly and indirectly involved. The directly involved stakeholders are those who either contribute in funding a project, or without whose general support a project will fail to succeed. The indirectly involved stakeholders are those who are indirectly affected, or may have an indirect effect on the project, such as other government departments, for example the City of Cape Town Roads and Stormwater Department, which is concerned with flood prevention. A crucial task for the Roads and Stormwater Department is to ensure that the water in rivers flows toward the sea as quickly as possible, in order to prevent flooding. To do this, they need to ensure that the river corridors are clear of both aquatic and terrestrial plant invaders, as these corridors are a popular breeding ground for IAS (Chamier, Schachtschneider, Le Maitre, Ashton & Van Wilgen, 2012:346). Pressure from other municipal departments may be exerted on the IAS management team to remove IAS in an area that is not the highest priority in terms of the scale of invasion in that area. This template is the closest approximation of a framework for dealing with IAS, although it is not aimed specifically at focusing on any existing or potential conflict situation. Conflict usually arises only once a site has been selected and a management plan proposed.

Participants were asked what processes are followed, in light of the absence of any formal framework, in order to negotiate, if possible, a way forward once a conflict has emerged. One participant said, “Ja, it’s possible, but you need to look at what we do for the mallards, for example: awareness, awareness, awareness”. Responses such as this one were common amongst the IAS managers, all of whom were of the opinion that one of the most important ways of dealing with, or even preventing, a conflict is to render the public more aware of the issue and the facts.

A second suggestion was explained as follows: “the key is that you never go alone; if you go alone, then you’re dead. So make friends”. Another seemingly common way for IAS managers to avoid conflict is to associate with many different, relevant conservation agents and NGOs. IAS managers are of the opinion that the more reputable the partners that they “team up” with, the more likely they are to avoid

conflict or diffuse a conflict. This is significant, as two of the public participants mentioned that environmental organisations usually “team up” against the public. This is not necessarily the case, nor the intention of environmental organisations.

There is a process involved in facilitating co-operation among organisations working on a project; it is not necessarily a case of them viewing the public as the enemy against whom they must unite. The process is based on research that has been conducted, or is underway. One organisation will present the research that has been conducted, and propose a plan of action in terms of the method to manage the target species. The other organisations will then state whether they agree with the proposed plan of action. A researcher will be invited to examine the plans to assess whether they are appropriate for the target species. When there is insufficient evidence that the proposed plans are appropriate and/or effective, IAS managers decide whether they need to take a calculated risk. This is the procedure that was followed in the case of the mallard ducks, when the City of Cape Town joined forces with reputable partners that are well-known and respected, such as the Avian Demography Unit, BirdLife South Africa, the Society for the Prevention of Cruelty to Animals, CapeNature, South African National Parks (SANParks), and the South African National Biodiversity Institute. One of the study participants explained the advantage thereof as follows: “so when the problems came, I copied all of them in [to the complaint emails], and they all supported the project, so nobody turned around and said that [they] don’t agree with the city. The important role players agreed. So make friends”.

So-called “Friends” groups, such as the Friends of Liesbeek, are volunteer organisations tasked, in partnership with the City of Cape Town, with the maintenance and environmental upkeep of an allocated area, which sometimes involves the control or removal IAS. Friends of Constantia Valley Greenbelt and Friends of Rosebank and Mowbray Greenbelt also play an important role in this regard, but is a topic that will be explored later in this chapter.

The next step in facilitating co-operation among organisations working on a project is to devise a campaign that will be used to inform the public and various interest groups of the aims of the project. The aim of the campaign is to relay a message across to the public that justifies the need for the intervention in a way that will be well-received and most likely to gain their support going forward. This is congruent with the argument put forward by Sharp *et al.* (2011:2098) with regard to the management of environmental issues, i.e. that the public are more likely to

support management plans if the scientific discourse is conveyed in a way that resonates with them.

During the last three years, the way in which campaigns are developed has undergone a few changes, according to lessons that have been learnt from previous campaigns. It is becoming increasingly clear that the way in which the message imbedded in the campaign is constructed, plays an important role in the way the campaign will be received by its intended audience. It is important, according to IAS managers, for a campaign to focus on a positive aspect of the project. In the case of the mallard ducks, a strong focus was placed on saving the indigenous waterfowl instead of eradicating the mallard ducks. Constructing the campaign in such a way detracts from the negative aspects of the project and instead instils the notion of saving the indigenous waterfowl, which resonates better with the public than the notion of killing off the mallard ducks. An example of such a campaign is presented in Figure 2 below. Managers have stated that the best way to develop a campaign that will resonate positively with the public is to enlist the services of a professional science communicator with experience in communicating with the public.

Save Our Indigenous Waterfowl

Yellow-billed Duck Red-billed Teal Cape Shoveler Cape Teal

Threats to our waterfowl include:

- **Mallard ducks are a threat to the survival of our South African waterfowl.**
- **Invasive plants, such as water hyacinth, reduce habitat for waterfowl.**
- **Pollution creates poor water quality and decreases food resources.**

What can you do?

- Report Mallard duck sightings to www.ispot.org.za
- Don't keep Mallard ducks as pets.
- Don't feed the ducks.
- Plant indigenous plants.
- Never dump aquarium water, fish or plants in wetlands.
- Report illegal dumping and littering: 021 596 1999.

The survival of our indigenous waterfowl is in your hands

Environmental Affairs, Agriculture, Forestry and Fisheries, Water Affairs SANBI BirdLife International Animal Demography Unit

Figure 2: An educational campaign launched by the City of Cape Town in October 2013 (Source: www.invasives.org.za)

4.2.2 “Bring in the professional”

A participant relayed to me the case of a public outcry about the mallard project at a dam in Durbanville, where the services of a professional science communicator were enlisted in an attempt to diffuse the situation. The participant proceeded to say,

the professional dealt with them, I never got a call. She sorted the whole lot out, because what people do is that they make it political, they run to the counsellors and they say, “City [of Cape Town] is at fault”, and then the counsellors are very sensitive and they put pressure on us not to do certain things. So we’ve got to talk, and then when we go to the public we get the professional in to find out where the problem is, because not everybody feels the same about these things, but emotions: they play a role.

All of the IAS managers from various organisations seem to use the same communications professional (all those who were interviewed mentioned the same name) to attend to all of what they refer to as the “people”-related aspects of IAS management, because they have learnt that if this aspect is not managed properly, it has a tendency to escalate into an unnecessarily hostile situation, due to something that was said or the way in which it was said. It has therefore become common practice to enlist the services of a professional science communicator.

Three of the participants referred to this individual as their “secret weapon”. One put me in contact with the communicator, which enabled me to interview the person. One of the first questions asked was what made the individual so sought after for the purpose of resolving conflicts regarding IAS in Cape Town, considering the individual does not reside in Cape Town, or even the Western Province. She said “It is my qualifications and experience that means I am better equipped to deal with situations than most [referring to IAS managers]. I started out as an environmental sciences lecturer so I actually have a Master’s in Environmental Sciences”. She then went on to say that, since she had been well exposed to academia, she is not intimidated by scientists in academia as most of the IAS managers are. “I have been in the system, I have been a lecturer at university, so they don’t frighten me, and I know what their good points are, and I know what their bad points are” she said. She decided to leave academia to pursue a career in the media, working her way up to Editor in Chief of seven magazines during her 18-year career, which taught her what people want from a magazine and how to deliver it. During the course of her career

she was, and still is, a senior columnist for two independent newspapers. She is therefore regarded as highly qualified in environmental communications.

With regard to her knack for resolving issues, she states, “I have faced multiple situations, both with the magazines and newspapers, where I have dealt with lots of people and I know what diffuses dramas”. After a long discussion of how she has come to be in the position she finds herself now, she added:

So why am I their secret weapon? They say I am their secret weapon, although I don't think I'm a secret weapon. It's that I have an enormous understanding of the public, because I have spent 20 years directly supplying copy and diction to them and I am also quite a regular radio expert, so I have been a lot on radio and I know what the machinery is going to do. So when somebody writes to a newspaper, I know what the editors in the newsroom are doing; I know what they are thinking; I know how they are going to present the copy; and therefore, if you know that amount of information, you know how to combat it.

Therefore, what renders her such a valuable asset is that she is able to predict the outcome of actions taken by the opposition, given her vast experience, and she therefore knows how to manage the conflict. Her senior status in journalism in South Africa gives her a power advantage, and she is able to hold activists accountable for the allegations they make, and to say to them, “come on now, let's get a little sensible here. You are going way over the top and you've got the wrong end of the stick. Here are the facts”. As a senior journalist, she has the confidence to inform a fellow journalist when he/she is misleading the readers, and believes no journalist would want to sabotage his/her career by doing so.

Another aspect that contributes to her success in Cape Town, says the communicator, is the fact that she does not reside in the Western Cape province:

I don't live in Cape Town, and because I am not connected with these people and they don't know where I come from and they don't know who I am, I can often move into those environments as a facilitator – an unknown and untainted facilitator.

Many of the strong members of the public opposition in Cape Town are familiar with the names of the few and well-known IAS managers. In her experience, as well as that of the IAS managers, the members of the opposition have viewed these managers as their enemy since the onset of the conflicts. This renders it difficult for the managers

to enter a site and achieve the same results that she can, says the facilitator. She continues to say “I am a fresh breeze, I am a new person and I am very well trained in listening – all journalists are”. In this sense, the public see her as an outsider, as they are not familiar with her as part of the management group. This constitutes an example of in-group vs. out-group sentiments, as presented by Duckitt (1992:68-69): the public do not identify with her being part of the in-group (IAS managers/native species), and they are therefore more welcoming of her, and are more open to what she has to say, because the prejudice they have as the out-group does not apply to her.

Although she argues that being an outsider assists her in achieving her goals, at the same time she is employed by a leading independent newspaper in Cape Town, and her picture has appeared in the newspaper every week since 1990, which provides her with the leverage she sometimes needs to “put activists in their place”. If it is clear that an activist chooses to be what she describes as “unnecessarily uncooperative”, she can remind them that the newspaper would be willing to publish the IAS managers’ side of the story, along with their actions so far. She has had to do this before, and “this usually sets them on the right track”, she says. In this sense, she is positing that “setting them on the right track” is to encourage their cooperation with the managers and thereby reach some kind of agreement or compromise. This intimates that she believes it is sometimes necessary to re-establish the power hierarchy in which she is ranked higher than the activists. She concludes by saying, “so I also wield a big stick, so if they actually don’t behave, then it helps that I am highly connected to a local newspaper”. This, she emphasises, is not an option she would like to use, and she considers it to be a last resort. She prefers to meet face-to-face with activists, or concerned members of the public. She refers to a time during the Mallard conflict that was also mentioned by three IAS managers, when she had a four-hour one-on-one conversation with a member of the opposition to determine exactly how the opposition felt about the issue and why they were opposing management actions. During this time she answered all the questions the member of the public had, and tried to ensure he/she understood the reasoning behind the actions of IAS managers from an ecological standpoint, by providing information regarding the IAS impacts managers are trying to mitigate. “This is what makes her so valuable and this is why she is the best; I don’t get any more complaints once she has spoken to them”, said one of the IAS managers. Her vast skills set and countless years of

experience render this individual an invaluable asset when it comes to dealing with various social elements of invasion biology, especially where conflict is concerned.

4.3 Describing the conflict

Although it is recognised in the literature that conflict involving the control and management of IAS in South Africa is an issue of concern, and poses a significant barrier to the implementation of IAS management projects, not much more has been written on the issue within the academic sphere. Many of the limited number of studies available on the subject simply describe the most common and simplest level of conflict that one can encounter, i.e. conflict between the public and IAS managers. The actual scope of conflict, however, ranges far beyond what is commonly reported. When asked why conflict reporting is a neglected aspect in the field of invasion biology, a few IAS managers mentioned that those involved often begin to focus more on implementing management plans once the conflict has been resolved, and writing a report competes with other, more pressing priorities. One explained,

as a manager I have to make sure I am on top of 20 things at the same time, so once a conflict has been resolved and I have been given the green light, then I try my best to get my men on the ground as fast as possible. Time is of the essence for invasives, and the quicker I get in, the better the chance of eradication, so a report always takes a back seat, although I always had the intention of writing it.

Managers always have other projects of high priority that occupy their time, so it seems almost impossible that they would have the time to adequately report on a conflict. One participant added, “this is why we need a study like this to be done, so we can tell you all about the conflicts and you can report on them, so others can learn from our successes and mistakes”.

4.4 Types of conflicts

During the course of the research, several types of conflict involving IAS emerged, which include, but extend far beyond, the scope of the conflicts between IAS managers and the public which are commonly reported in the literature.

4.4.1 Conflicts between the public and IAS managers

This is the most commonly reported conflict in South Africa, and denotes the public opposition that IAS managers are met with when they attempt to implement management plans for a specific area or IAS. According to the managers interviewed, this is the form of conflict that poses the greatest barrier to effective and successful management and control of IAS in South Africa. One of the most common barriers they face concerns private landowners refusing to grant them access to their land to remove an IAS. IAS managers can follow many strategies in order to gain the approval of landowners, and these will be explored later in this chapter.

4.4.2 Conflicts among individual IAS managers

This type of conflict occurs fairly often, according to the managers. Almost every IAS manager interviewed mentioned at least one experience of a conflict with another IAS manager. Conflicts between IAS managers can occur between managers within the same organisation, as well between those employed at different organisations. Different environmental values related to the species or area in question are the cause of this type of conflict. These conflicts are generally easier to defuse than conflicts that involve the public, as frameworks are in place to facilitate conflict resolution. Although different organisations usually each have their own way of managing such conflict, there is always a clear and established hierarchy to follow in one way or another. The causes for such conflict will be explored in the next section of this chapter.

4.4.3 Conflict within and between environmental organisations

This type of conflict usually occurs when management plans and area clusters or management areas are not clearly defined, and organisations are not certain under whose mandate a particular area falls. This has caused much strife in the IAS community comprising those who are tasked with the management of IAS in Cape Town. Sometimes the same area of land is managed by different organisations for different IAS that are present on the same piece of land. When this is the case, it is common for the organisations to clash at some point.

4.4.4 Conflicts between environmental organisations and government

This type of conflict bears similar characteristics to that mentioned above. Government departments often have their own agendas on clusters of land, and a clash of priorities occurs when their management plans interfere with those of other environmental organisations concerned with the control and management of IAS.

4.4.5 Conflicts within and between government departments

Akin to the aforementioned, different government departments have their own priorities and agendas, and little is done to communicate these across departments. Since some of these priorities of different departments are accorded to the same piece of land, a clash of priorities between government departments is sometimes inevitable.

4.4.6 Conflicts between scientists and IAS managers

This conflict category refers to conflicts between IAS managers and scientists tasked with researching new areas in invasion biology. This is an aspect of conflict concerning the control and management of IAS that is not afforded much thought, say managers. I have been unable to find any reports documenting the conflict between scientists and managers, although the issue was voiced by almost all managers during the interviews. According to IAS managers, they depend on researchers to devise appropriate ways to effectively control and manage species. However, the research conducted does not always lead to results that can be practically implemented. Often, research does not take into account the time and budgetary constraints that IAS managers contend with. Researchers would suggest, for example, the use of expensive machinery or long-term plans that are not feasible for managers to carry out. IAS managers also mentioned that research is becoming increasingly more specific or “niche”, as there is increasing focus on South African-specific issues which is adding vastly to scientists’ and managers’ scientific knowledge on the topic. Although this trend is advancing the field of invasion biology in South Africa, it unfortunately does little to assist managers in terms of practical implementation.

4.4.7 Conflicts among scientists

Scientists who have invested time and energy into researching different methods of controlling IAS may argue that, for various reasons, their method is the best. Not all scientists agree with other research that has been, or is being, undertaken on the same species or area on which they are working. One of the most debated topics in invasion biology at the moment is the use of biocontrol as a method of eradicating IAS. According to participants, biocontrol research has been conducted for approximately a century in South Africa, but the topic is still highly debated among scientists and IAS managers. It takes several years of research to determine whether a biocontrol agent is suitable for the conditions present in an area, and many scientists are of the opinion that other avenues are more worthy to explore, given the time commitment biocontrol requires.

4.5 Reasons for the conflict

4.5.1 “It all boils down to communication”

There are various reasons for the occurrence of conflict involving IAS in Cape Town, but the most significant mentioned by all participants is a lack of communication between all actors. Something that seems so basic is viewed by all stakeholders as an impossible obstacle to overcome. A lack of communication is also a cause of each of the types of conflict mentioned above.

Public participants expressed their dissatisfaction with the efforts of environmental organisations to inform them on their various projects and management plans. One said,

they always come with these fancy flyers and things only after I have something to say about it, and then they say, “Oh, didn’t you know what we were planning to do? Here it is on the flyer”, like I have seen it before. If this is how they want us to find out, then who are they giving this flyer to?

The flyers convey campaign information that supports and justifies the need for management actions the City of Cape Town plans to take, often in partnership with numerous environmental organisations in the city. An example of information contained on such a flyer is shown in Figure 2. The flyers can be found on the City of

Cape Town website, information centres around the city and Heritage Sites, and they are often distributed in areas targeted by management plans. Members of the public, although seemingly willing to receive the information presented on the flyers, do not all seem to have equal access to them, and this reflects one of the many underlying reasons for a lack of effective communication. The messages on the flyers can only be communicated to the public if they reach the public.

This is especially the case with private landowners: if they are not informed of the projects and management plans, they are less likely to allow IAS managers and workers onto their property. One of the IAS managers described this as a “huge” problem, because in many cases the IAS managers are not present, leaving the workers, in their overalls, to approach the land owners’ houses. Given South Africa’s history of racial segregation and displacement, many of the areas with gardens that IAS managers want access to are located in “whiter” areas where the majority of the land owners are white. Since one of the main goals of IAS-related projects is to create jobs for previously disadvantaged population groups, many of the workers are likely to be black males. The difference in race, according to a manager, coupled with the increasing crime rate in South Africa, means that people are hesitant to let unknown individuals onto their property, especially “a black unknown man in a green overall saying he wants to remove some plants from their garden”. Land owners are more likely to give access to individuals who are wearing the official City of Cape Town uniform or, in the manager’s experience, white individuals with whom they are more familiar. A possible reason for this, states the manager, is that the project coordinators, who are typically white and have a tertiary education on the subject of IAS, are better able to answer the questions the land owners ask regarding the need to remove the species. This also ties in with a lack of environmental education, which will be explored in the next section of this chapter.

Based upon an investigation of various environmental organisations’ websites, it is clear that the organisations and their IAS managers are making a concerted effort to exercise full transparency with regard to their various projects, both future and current, and their management goals. The SANParks website is user-friendly and encourages the public to participate in negotiation processes relating to the management plans for various national parks, Table Mountain National Park (TMNP) being one of them. Figure 3 below presents the most recent version, at the time of

writing, of SANParks' attempt to include the public in the development of management plans:

Process for Developing or Revising Park Management Plans

The Protected Areas Act requires that a national park be managed exclusively for the purpose for which it was declared. However, SANParks recognises that the environment is in constant flux, is interlinked with the socio-economic and political spheres and could be affected by societal values. Protected area management should therefore take cognisance of the ever changing environment and diversity of influences, and plan accordingly. In consultation with stakeholders SANParks will be revising the management plan of each park approximately every ten years.

Management plans that will be reviewed during the period 2014/2015 are:

- ✱ Addo Elephant National Park (AENP)
- ✱ Table Mountain National Park (TMNP)

Notice is given to all interested and affected parties that in terms of section 39, read with section 41 of the National Environmental Management: Protected Areas Act No. 57 of 2003 (NEM:PAA) that SANParks is revising the park management plans for Addo Elephant National Park (AENP) and Table Mountain National Park (TMNP). The TMNP management plan is also being revised in terms of section 21 of the World Heritage Convention Act No. 49 of 1999 as the Park forms part of the Cape Floral Region World Heritage Site.

The purpose of the park management plan is to guide the future management of the respective National Parks for the period 2015 - 2025. The NEM:PAA requires that interested or affected persons be given the opportunity to comment on the plan.

Please note, you are required to register in order to participate in this process by accessing the SANParks website at www.sanparks.org/conservation/park_man/forms/reg_form.php. You can also register by telephone or post (see contact details below) and at the public information sessions. The stakeholder participation process will run from 16 February to 28 March 2015 for TMNP and from 23 February 2015 to 03 April 2015 for AENP.

Electronic versions of the management plans will be available on the [draft plans page](#) on the following dates:

- ✱ TMNP - 16 February 2015
- ✱ AENP - 23 February 2015

The plans can also be viewed at the following locations:

Figure 3: Information posted on the SANParks website regarding the process for developing and revising park management plans (Source: <https://www.sanparks.org>)

SANParks also listed all the locations at which the public could participate in negotiations that were to take place, along with the dates as per each location, to allow people to prepare in advance. SANParks also provides an outline of how the stakeholder-participation process would proceed, as shown in Figure 4 below:



Figure 4: The stakeholder participation process, as presented by SANParks (Source: <https://www.sanparks.org>)

The stakeholder participation process this environmental organisation proposes is a carefully considered plan which should produce results that are in line with consensus-based models for making environmental decisions, and should therefore, in theory, reduce the incidence of conflict regarding the management of IAS (which comprises only a part of the management plans for national parks such as TMNP). However, despite all the information that is available on environmental organisations' websites, and the invitation to all members of the public to participate in negotiations,

the public continue to claim that environmental organisations are not communicating with them, and are not informing them of management plans regarding IAS. Schmidt (2006:19), a member of the public, expresses such sentiments when he states that “the fact that there is an increasing outcry against the felling of the pines is indicative that the public participation process has not worked and that SANParks have been economical with the truth”. Statements such as this seem to indicate that alternative methods for public participation need to be considered. SANParks employees did, however, assure me that they have learnt from the shortcomings of the participation frameworks they used in the past, and that the current frameworks have been developed to address the downfalls of previous models, by placing more importance on public stakeholders and incorporating them into decision-making processes. Perhaps an alternative channel through which to inform the public of these participation processes should be explored, as the website does not seem to be as effective as SANParks had hoped, since people generally do not seem to regularly visit the site as a source of information in order to keep updated on new developments. The website also excludes the section of the population that does not have access to a computer and/or the Internet.

4.5.2 There is no participation without communication

On the 16th of April 2015 I attended the Park Management Plans (PMPs) stakeholder meeting held in Newlands. Until one day before the meeting I had been unaware that these meetings were taking place, as I had not come across any information outlining them or when they were to be held. I discovered this meeting by chance on the TMNP Facebook page on the 15th of April 2015 from a post that said the meetings had been postponed due to the fires Cape Town had experienced, and the Newlands PMP meeting had been rescheduled for April 16th at 17h00. No additional information was provided. I attended the meeting with the intention of observing the stakeholder input process that I had not yet had the chance to witness first-hand. Nineteen members of the public attended the meeting: 14 men and five women (including myself), with their estimated average age ranging between 45 and 60 years.

The meeting commenced with the park manager stating that it is important to have these meetings, as public sessions are made mandatory by the national Department of Environmental Affairs (DEA). It therefore seemed that the meeting

was viewed as a box that needed to be checked in order to be compliant with DEA NEMBA policy. The PMP meetings were scheduled to take place in 10 locations around Cape Town, and there would be three rounds per location (see Addendum 3). The park manager then proceeded to outline the structure of the meeting, stating that there were 24 sections in the proposed management plans representing the 24 ongoing programmes taking place in TMNP, of which IAS comprises one. Attendees were to go through each section, conveying comments or questions they have regarding each section. The public attendees were expected to come to the meeting prepared with a printed copy of the proposed plans that they had read beforehand. However, few of the attendees did so, as most were unaware, as was I, that this was expected of them.

One of the attendees asked why SANParks does not have an ongoing public-input system in the form of a meeting that is scheduled once every month or two. The park manager responded by stating that a similar concept – the Park Forum – had previously been in place although the forum no longer existed. He was unsure of the details, including who was responsible for facilitating the forum, and could not say with certainty why this group no longer existed. The attendee responded that, although he suspects the Park Forum was not the best way to voice their opinions as stakeholders, “people like to know its there”. The park manager acknowledged this, and expressed commitment from TMNP to investigate reinstating the forum. From the attendee’s response, one can deduce that 1) stakeholder forums are not necessarily the best method for voicing public opinion; or 2) TMNP management is not likely to take public opinion into consideration when devising or executing management plans.

One of the first issues mentioned by the attending members of the public when the IAS section was reached, was the removal of pine trees within TMNP, to which the park manager sternly responded, “the pine trees will go”. One of the members of the public then addressed the individuals who had brought up the issue of pine trees, stating that he was initially against the removal of pine trees. He went on to say that he was impressed with how rapidly the fynbos began to reappear, and that the unique flora is a reason TMNP is part of a World Heritage site. He also highlighted the safety that fynbos brings in terms of decreased fire risk and decreased crime in the park. The loss of aesthetic appeal during the phase between tree felling and waiting for the fynbos to grow was raised by another attendee. He assured this member, as well as the others, that if they pay attention to the plant growth during the restoration process, they will see visible differences in the fynbos density soon. The members involved in

the discussion nodded, seemingly in agreement, and nothing more was said on the issue.

Toward the end of the meeting, one of the attendees raised an issue he had been grappling with since the meeting commenced – a lack of communication, specifically in terms of getting the information about the meeting to the public. He too had discovered the meeting by chance. The other attendees nodded and agreed in support. It was then revealed that most of those attending had come across the information on the PMP by chance, and this is why they came unprepared. The park manager explained that they had placed details of the meeting in libraries, national and local newspapers, and on the SANParks website. The members of the public responded by saying that these methods are inadequate, as they do not reach those who are interested in how the park is managed.

SANParks as a whole was then critiqued for what the public believe to be poor communication skills and a resulting lack of communication and transparency. The park manager said that he was unaware the public felt this way, and that he was under the impression that SANParks was successful in reaching those who have an interest in TMNP management. One individual raised the point that he expected an attendance of 500 people, not 16 people. He expanded to say that he knows many people who would have liked to comment on TMNP management plans, but it is likely that they are unaware of the meeting. Another member said that SANPark's lack of communication makes him feel alienated, in that he is excluded from the way the Park is managed and from its future development plans. He pointed out that this is the first time he has ever been included in a decision-making process regarding the Park, despite the fact that he visits the Park almost every day after work. He advocated strongly for better communication between the Park management and stakeholders with a vested interest in the Park's future management, and suggested that SANParks start an emailing system to which people could subscribe online and receive news concerning the Park directly. He emphasised that such a system would have to be adequately publicised in order to reach individuals who are interested.

When the meeting concluded, attendees were provided with a Stakeholder Registration Form (see Addendum 4). Registering as a stakeholder by completing this form is necessary in order for members of the public to provide feedback they would like TMNP management to take into consideration in the revision of the proposed plans. All members were requested to write down their comments on the sections of

the drafted plans to which they pertain, and email or fax the document to contact details on the SANParks website. This is one of the ways in which SANParks tries to keep lines of communication with the public open.

According to the managers, lack of communication can also originate from the side of the public. One of the managers pointed out that “the masses are generally quiet most of the time, so one does not actually know what they are thinking”. Commonly there will be a few vociferous individuals who will voice their opinions “too loudly”, according to managers, but the rest keep quiet, so it is difficult to gauge their perceptions and attitudes and how they will perceive or react to management plans and action. Often there is no way of knowing this until management actions are attempted.

Interestingly, all except one of the public participants that were interviewed in this study had not voiced their opinions in any formal way, such as on an online forum, in the national media or in an email addressed to the relevant person, in order to inform the IAS managers of their disapproval of management actions. This result can be attributed to the selection criteria I applied for public participants, as I was unable to gain access to the details of people who laid complaints directly to the IAS managers via formal channels. All but one chose to directly inform officials about their disapproval of management plans when they encountered them, and this was always done after management plans had been attempted. This is frequently due to the fact that participants do not know of intended management plans until after they have been implemented.

The public participants also said that they do not regularly check the websites of departments or environmental organisations tasked with the management of IAS. Seven of them said that they have used Google to search for phrases such as “why are Cape Town ducks being killed”, “removal of Mallard Ducks in Sandvlei” and “pine trees being cut down on Table Mountain”. When asked if they would have voiced their disapproval through formal avenues had they known of intended plans, the participants seemed unsure. One participant said, “it seems like a lot more effort than its worth; they probably won’t take it seriously anyway”. This statement was congruent with the answers provided by the other public participants, implying that they do not complain via formal channels because they do not believe their opinions will be considered before plans are executed. In this regard one can clearly observe in-group vs. out-group dynamics, with members of the public feeling as though they

are not included, and will not be included, in the development of management plans. One could argue that the public are aware that they lack power where the formulation and implementation of management plans are concerned, and they have taken to seeking information on the topics of pine-tree and mallard-duck control as a way to gain some sort of control; a reaction to power deprivation outlined by Pittman and D'Agostino (1985), as reviewed in Chapter 2.

A lack of communication is also cause for conflict between environmental organisations. As mentioned before, different organisations are often tasked with managing different species on the same land zones. Land zones are demarcated areas of land that are divided up and allocated a number to facilitate the management process. Different species often require different methods of management to promote successful control or eradication. Often the efforts of different organisations clash, and this causes strife between them. Conflict caused by a lack of communication between environmental organisations on the one hand and government departments on the other is also a common issue, and very similar to that between environmental organisations. One manager mentioned that they are attempting to facilitate the spread of indigenous wild flowers, to compete with the IAS in one of the parks in Claremont, but since the City of Cape Town's City Parks Department has begun to outsource their mowing contracts for that and other pieces of land, there have been numerous disagreements between his organisation and the City Parks Department. He started explaining this situation by saying,

we have conflict around this time of year, because the grass is starting to grow, but a lot of the wild flowers are starting to bloom in the next month or two, and we would prefer for them to leave that mowing, so the wild flowers can at least set seed before they come and mow, but we have tried many times with different managers, and we always think we have an understanding, until we arrive one morning and find the place mowed.

After instances such as this, the manager approached the Department and tried to come to an understanding whereby both their objectives could be met without encountering conflicting goals. He went on to say,

they have even published their mowing schedule and given it to us, but they haven't followed it. Their mowing schedule is like road markings in China: they

are just there to decorate the roads, they have no bearing on what they are supposed to do, and they are not remotely realistic.

This was not the first time during the interview process that an IAS manager mentioned that he/she was under the impression they had reached an agreement or understanding with another organisation or government department, only to find that that other organisation or department had proceeded contrary to the agreement. He concluded by saying,

so it all boils down to communication: if someone had said, “We are coming in to do this”, and we said, “Oh great, can you do it this way or that way?”, we could have actually reached an understanding beforehand.

Cases such as this were often narrated during interviews, and show that conflict between environmental organisations and government departments could be avoided or lessened, at least in theory, if effective communication were to be practiced. One of the IAS managers summarised that conflict between environmental organisations and government departments is caused by a “clash of priorities”, which is ultimately fuelled by a lack of communication.

Conflict caused by a lack of communication is also present between government departments. An example concerns an agreement the City of Cape Town’s Invasive Species Unit had reached with the then Roads and Stormwater Department [now known as the Transport for Cape Town (TCT) Department] not to dredge a certain part of a river canal that was under their management mandate, because they were working with a Friends group to reintroduce some of the biological diversity in the canal before again attempting to remove the invasive aquatic weeds. The TCT Department is tasked with getting storm water to flow to the sea as quickly as possible in order to avoid flash floods in the city. On a maintenance-check visit to the river, an employee of the TCT Department saw that the invasive aquatic weeds were overgrown, and instructed his team to dredge the river. He was unaware of the agreement that was in place, because it had not been communicated to him. This caused conflict between three different teams, which could have been avoided if the agreement had been communicated to all members of the TCT department.

A lack of communication was also reported as causing problems between IAS managers and scientific researchers in the field of invasion biology. Many of the IAS managers are of the opinion that much of the research that is being conducted in this

field is not specific to the needs that arise, or the challenges that are faced, during the practical management of IAS. Yet these concerns are often not communicated to scientists, who continue on their existing research paths. Although this lack of communication does not cause conflicts as severe as the ones that were mentioned above, it does cause disagreements between managers and scientists, which may limit the extent to which scientific research fuels advancement in the practical management and control on IAS.

One of the participants is tasked by her organisation with being positioned at the interface between IAS management and the science underlying it. When asked to describe her position and any challenges associated with it, she responded as follows:

We speak different languages. When you go into a management meeting, it's all operations and budgets and staff requirements, and then you go to a science meeting and it's all theories and models and hypotheses, and the two just don't match. They have different outcomes, so I am a translator. I found it with the public as well. Management come and say, "Well, we have this Act and regulation", and the public just switch off, because they just want to walk their dogs.

This shows how important it is not only to communicate, but also to consider the way in which one communicates. Stakeholder groups do not speak in the same way, use the same terms or have the same understanding of concepts, and it is imperative to take this into account when addressing various role players. The manager mentioned that it is easier to communicate with other managers and scientists, because she is more familiar with their language, and she knows many of them personally. This is not, however, the case when the public is concerned.

But moving to speaking to the public stakeholders has been difficult, because I don't know them on a personal basis, and they see me as a scientist from a well-known conservation organisation (...), so they aren't so much against me from the management, but from the science side.

Communicating with the public is challenging, according to the manager, and is further complicated by the fact that they view her as a scientist and not as a manager. From this one may deduce that, in the eyes of the public, scientists rank higher than IAS managers on the spectrum of power and influence. She concluded by saying that one of her biggest obstacles in this regard was that she needed to "break down" the

perceptions that people have of her. This will be explored in more detail later in this chapter, when environmental values are considered.

According to the managers, the lines of communication along which to relay information from scientists to managers and vice versa are slowly becoming more open due to emerging partnerships between environmental organisations and research institutions. These partnerships are still in their early stages; generally most have been in existence for less than two years. One of the managers said,

they don't yet inform us, because it is still early days, but the involvement and the partnership is absolutely essential for the way that we are managing. So there is prioritisation, and once we have the results of the different research projects, it will surely change our way of managing dramatically.

There is much enthusiasm for these partnerships. IAS managers express feelings of “walking in the dark”, because many of their current management plans are not informed by scientific research, as the research has not been done yet. Rather, it is informed by what they have learnt through practical work in the field, and through trial and error. Partnerships with research institutions will allow IAS managers to inform scientists on what was effective in the field, and what was feasible, so that they can alter the direction of their research accordingly. This way scientists could direct more resources toward exploring avenues of research into management methods that have been proven to be effective and can be implemented in the field. It would, however, be incorrect to state that there is currently a complete lack of research on such methods. According to one of the managers,

there is research, it is there, but nothing on Cape Town. So what we want to look at is at Cape Town specifically, because the thing about Cape Town is that it has got Table Mountain which is a World Heritage Site; it is one of the 7 wonders of the world; it's a massive park with massive tourism potential; it's a substantial part of the city. So you sit with this national heritage site within a city surrounded by urban areas, so you've got the edge effects or impacts. Then you've got about 20 nature reserves in the city. The city is in the heart of the Cape Floral Kingdom, so you can't compare Cape Town with New York, or any other [city]. There are more indigenous species in Cape Town than there is in the entire UK, you know: it gives an indication.

As is evident from the quote above, managing IAS in a region such as Cape Town poses unique challenges: “it's not just about managing invasives in an urban area, its

managing invasives in an urban area with the complexities of having these six or seven vegetation types and fragmentation because of urban pressures”, says the manager. There are high hopes among IAS managers that partnerships such as these will narrow the communication gap between scientists and IAS managers, and therefore lead to research that is more useful to the managers.

4.5.3 Educate to participate

An additional cause of conflict involving IAS is a lack of environmental education, mainly amongst the public stakeholders. In some cases, however, it is not a lack of education that is the primary issue, but rather resistance to the views of IAS managers and invasion biologists being imposed on the public. Most of the public participants were quick to admit that they did not know much about IAS, and that it would be valuable for them to learn more about the issue. This lack of knowledge is what public participants identify as the main reason they have not laid any complaints concerning IAS management via formal channels. An example of this caution to enter the debate is reflected in a letter a member of the public wrote to a newspaper regarding the removal of pine trees, in which he said, “By and large it’s a pretty sound policy to keep quiet on a topic when you know nothing about it [...]” (Wills, 2011:15). Hereby he insinuates the existence of a perceived rule or “social sanction” that only those who are sufficiently knowledgeable about IAS are qualified to engage in debates on the topic. He then proceeded to state that this association between knowledge and power or right to engage needs to be challenged: possessing limited knowledge on the topic does not necessarily disqualify one from engaging in the topic (Wills, 2001:15). Wills (2011:15) also states that, if those with only a restricted scientific understanding of pine trees do not voice their opinions, then the debate will be saturated with experts.

Moreover, three of the eleven public participants were convinced that learning more about IAS would not change their perception of the removal of pine trees or mallard ducks, with one saying, “I get where they are coming from, but giving me the environmental reasons for what they are doing won’t make me feel any differently about it: I still think the [mallard] ducks should be left alone”. The other public participants were unsure if advancing their knowledge on IAS would change their perceptions about management plans.

This perspective from the public participants counters the common perceptions among the IAS managers on education regarding IAS. Almost all of the IAS-manager participants said that environmental education, specifically education about IAS, is seriously lacking in South Africa, and that it is a leading cause of conflict between IAS managers and the public. From their experience, members of the public oppose management plans concerning pine trees and mallard ducks because they are not very knowledgeable on the species and their environmental impacts. Perhaps this is the most obvious conclusion to jump to, as IAS managers are still in the “learning phase” of public engagement in the invasives debate. Therefore, managers are expending much effort on arranging events in the evenings, when people are more likely to be available, that are aimed at sharing knowledge about IAS, in particular their effects on the environment and indigenous biodiversity as the reasons for why they should be eradicated. These events are usually aimed at communities where environmental organisations are attempting to eradicate a species, usually from privately owned land. An example one manager provided involved the removal of invasive wild gingers from Bishopscourt, where the field workers were experiencing difficulties gaining support from the landowners. He described his approach as follows:

so we set up a workshop and a public meeting, and invited the people to come down, and we explained to them the long-term view of the project, and what we want to do, and how we need them to try and help us. And when we do that kind of thing, we tend to find that people do buy into it, but we have to work slowly: we can't rush it.

In this case inviting people was not difficult, because they were clustered in one area. One could interpret these information sessions and general desire to educate the public as a way in which IAS managers are using in their favour the uncertainty of the public concerning IAS, as described by Theodoropolous (2003:79). If the public are unaware of IAS, it is likely that they have not formed categories associated with IAS, and they will form these categories during their first few engagements with the topic, as per Kuhn's (1962:64) example with the playing cards presented in Chapter 2. The process of forming new categories is not a rushed and rapid one, as it takes a few times of encountering an object or issue for the categories to take hold. Once these categories have been established, it is difficult to change them, according to Allport (1954:164-174), so it is important to the managers to be the first to inform the public

about IAS in a way that will build categories that will lead to the support of IAS-management projects. The information sessions could be a way that managers maintain their power advantage – one reaction to a lack of power is to seek information (Pittman & D’Agostino, 1985). This way, managers are simultaneously maintaining a power advantage and promoting the public’s categorisation of IAS as “bad”.

Another manager spoke of the trouble he was experiencing at an apartment complex with a fence that was covered with an invasive alien plant. He needed to remove all of the plants urgently, as they were rapidly invading the area, but this would result in one being able to see through the fence, which the residents disliked, because they enjoyed the sense of security and privacy the cover provided. The manager then proceeded to host two information seminars for the residents, where he explained the need for the plant’s removal. After the second seminar, and after he had answered all their questions, the residents granted their consent for the project to proceed.

Managers have noticed that, when they offer to present evening information sessions on why they are carrying out a particular project at that time and what the project will entail, and at these sessions answer the questions that people may have, the public become much more cooperative and the project is completed faster. One manager said that she even receives requests from the public for her organisation to host more information sessions, and they are more than happy to oblige. The organisation believes that the information evenings have been successful thus far, because there have been increases in calls and emails from the public, communicating information such as “I think my neighbour has an invasive tree in her garden and she doesn’t want to cut it down”. This could be a result of the coercive powers Durkheim (1982:54) posits are externally exerted on the public to adopt the same beliefs and tendencies and act as a collective. When an individual acts outside of the collective, and therefore against the coercive powers, there is a chance that he/she will be subject to moral exclusion – an example of an informal sanction that Durkheim (1982:51) mentions is a consequence of challenging the collective. In this regard, one of the managers pointed out that,

a lot of the time the trees and plants we hear about are not Category 1 invasives, but they are Category 3 and they legally don’t have to remove them, but we let

them know that they will have to remove it at some point, and it will be cheaper and easier when it is smaller. So sometimes they do and sometimes they don't. So it will make our job in the future a little bit easier.

An interesting finding regarding education, mentioned by one of the IAS-manager participants with a natural science background who is tasked with trying to communicate with public stakeholder groups, is that the way she is received differs vastly according to the level of education of the individuals she is addressing. She explained, with regards to attempting to change their negative perceptions of her scientific background, that

often if it's a community group from an underprivileged area, they are much more open to discussions and they want to learn; whereas the more intellectual and educated people, like retired doctors and professors, they know everything, they don't want to learn: they want to tell you their point of view and be heard. It's very difficult to actually talk to those guys, it takes a lot longer [to get through to them] than [it does with underprivileged] community structures [groups] when it is an individual with an agenda.

This manager emphasised her desire to change the negative perceptions associated with her background in the natural sciences. Perhaps this desire stems from the hierarchical order amongst invasion biologists, which locates scientists above IAS managers, as the former are seen to be the ones who inform the latter. Consequently, in-group vs. out-group adversity seems to be more severe between the public and scientists than between the public and managers. Perhaps a reason managers find it difficult to engage with individuals with higher levels of education is because those individuals do not feel as powerless as underprivileged individuals who are generally less educated. Individuals who are more educated are less susceptible to manipulation, because they have most likely established categories for IAS and IAS management, whereas it is possible that less educated individuals are still in the process of building categories, and it is therefore still likely that category associations can be changed to support the actions and goals of IAS managers.

4.5.4 Values, perceptions and attitudes

Another cause of conflict involving IAS in Cape Town is rooted in different values people attach to nature, which ultimately lead them to maintain the attitudes and

perceptions of IAS that they do, and subsequently to act the way they do. This applies to different stakeholder groups as well as individuals within the same stakeholder group. As Figure 5 below shows, the way that people socially construct and perceive nature is based on their values of nature, and different individuals have different values of nature, depending on various factors associated with their lives, which constitute the social context within which individuals are located. The attitudes toward nature that they construct will directly influence their behaviour – in the case of this study, the way in which the public respond toward management plans for the control of IAS, and the way in which IAS managers devise and carry out management plans.

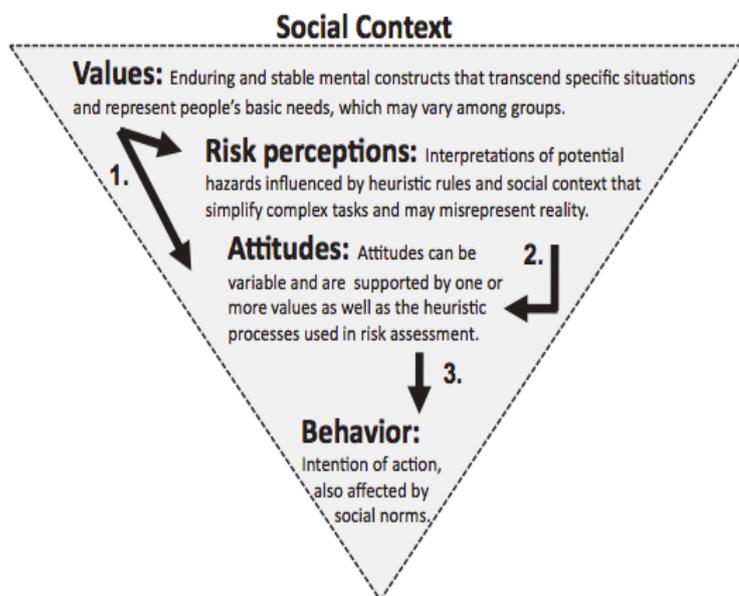


Figure 5: The way in which attitudes and perceptions of the environment are formed from values of nature (Source: Estévez, Anderson, Pizarro & Burgman, 2014:4)

Table 1 below shows the various values of nature that one may encounter in the members of both stakeholder groups. The majority of the public who were interviewed in this study tend to group the scientists and the IAS managers into what they view as a large, overarching and dominant body, and they perceive this collective body to have dominionistic values in relation to nature. From the public's perspective, the scientists instruct the managers what to do, and the managers instruct the public what to do; the managers are "on the side of" the scientists: they have the same goals. The public respondents suggested that this dominant body enjoys exercising control over nature, and dictates to the public what its members think a pristine environment

should look like, without taking others' opinions into account. Most importantly, in the public's view, the managers share the same values of nature as the scientists do.

Value	Definition
Aesthetic	Physical attraction and appeal of nature
Dominionistic	Mastery and control over nature
Humanistic	Emotional, spiritual, or symbolic affection for nature
Moralistic	Moral concern about the right and treatment of nature
Naturalistic	Exploration of nature and outdoor recreation
Negativistic	Fear or aversion toward nature
Scientific	Systematic and empirical study of nature
Utilitarian	Practical value or material benefit of nature

Table 1: Environmental values and their definitions (Source: Estévez *et al.*, 2014:4)

One member of the public explained, “it’s like they just want to say how they think it should be and we must all just be OK with it, but what if that’s not how we think it should be”. Cowley (2006:10), a member of the public who wrote a letter to a local newspaper, describes scientists and management officials as having “dictatorial and dogmatic thinking”. One of the managers tasked with, amongst others, engaging with the public, mentioned that she found this aspect of her job particularly difficult, because they view her as a scientist, making it difficult for them to change their perceptions of her, which she explains as follows:

It’s the perception that scientists are unsympathetic, they are rigid, sticking to the walls; and they only see the science and they don’t understand the emotional. And so the scientist is sort of this machine: no emotions, no understanding, this is like the model and the outcome – very structured – not as a person who actually has experiences and understandings of what they are talking about, but purely going on what the black and white of the model says. So they [the public] say “Yes, you talk about the facts, but you don’t understand what it’s actually like”.

She stated further that the public considers the scientists as more intelligent than the managers, but lacking in emotional capacity, whereas the managers are viewed as possessing more emotional capacity, but are not as intellectual, as the scientists.

The IAS managers interviewed in this study have varying views on the values that underlie the public's perceptions and attitudes concerning nature and, in the case of this study, IAS control and management. The dominant view is that the value system of the public is complex and they hold an array of values instead of just one. Managers described the public as displaying aesthetic, humanistic, moralistic, naturalistic and utilitarian values (as per the value descriptions presented in Table 1) regarding nature and, specifically in this case, IAS. One manager proceeded to say, with reference to compliance with management plans,

[i]t is very difficult, because people are so different as well. You can have the two same houses with the two people doing the same job and same everything, but the one will be happy to have you do it, and the other will say no for no reason whatsoever. It is all about what they think, and they all have different attitudes.

Indeed, my study shows that different members of the public do hold different values of nature, and that IAS managers and scientists do not constitute a homogenous group in this regard either. On more than one occasion in this study an IAS manager pointed out the difference between his/her values and those of a colleague, and how this brings their preferred management plans into conflict. To illustrate, one of the managers describes himself as a keen birder and said,

I have watched the bird communities in the river and I was fascinated to see the change before the dredging [a technique for removing invasive aquatic plants] started, and then after the dredging had been completed – to see the change in the community of birds that were coming down to the river.

He said that, “since the dredging removed all of the invasive aquatic plants, certain bird species no longer came to the river”. He would have preferred to retain some of the invasive aquatic plants, in order to maintain the diversity of bird life along the river. Another manager from the same organisation was adamant that this was, in his own words, “not the way to go”: all the invasive aquatic plants should be eradicated, regardless of the bird life they attracted to the river, because “if it is invasive it should not be there”.

There were a few instances during this study where some IAS managers would display humanistic and naturalistic values of nature, while their colleagues would display highly scientific ones. This would explain why the management styles of managers sometimes clash, and how this causes conflict between IAS managers. Another example of heterogeneous values within the IAS-manager stakeholder group presented itself in the case of the invasive pine trees. The managers are divided on the removal of pine trees, as one of the managers explains:

the one group [...] feel[s] that the trees, by their nature of being trees, are sacred and must remain, and [...] the other side [...] feels that if they are invasive, they must go.

This particular manager concluded with the statement, “there are no prizes for guessing which side I’m on”, as he holds highly scientific values of nature and therefore supports the latter position. Despite his scientific way of thinking, he said he can understand others’ position that certain trees have a “pride of place”. However, according to his dominant values, this does not detract from his conviction that they are invasive aliens, and should therefore be removed.

It is interesting to note here that IAS managers who support the view that IAS have numerous negative effects on the indigenous environment, are willing to make exceptions with regard to which plants and animals should and should not be removed. Moran (2010:40) accounts for this by citing research which shows that

behaviours that harm the environment do not flow from anti-environmental values and attitudes, and that pro-environmental values do not guarantee environmental protection. Rather, a range of theories propose that cognitive dissonance, norm activation, and theories of reasoned action and planned behaviour better account for these unexpected outcomes.

After a brief exploration of these theories, it would seem that the theory of cognitive dissonance resonates well with the findings of this study. The theory emerged in 1957, when Festinger set out to explain the inconsistencies in a species that generally strives for consistency: the human. He argues that, if people believe in something or support it, then they are likely to act in ways congruent with those beliefs (Festinger, 1957:1). In the case of IAS, this would imply that IAS managers believe in and support the removal of IAS, because they know the negative impacts these species have on the environment. This is what has been constructed as the truth in the field of

invasion biology – these are the (social) facts. There are exceptions, however, when the actions of people are incongruent with their beliefs and values. Festinger provides a simple example of individuals who know and believe that smoking is bad for them, and yet they continue to smoke regardless (Festinger, 1957:2). In the case of this study, the inconsistency Festinger is referring to was observed among those IAS managers who do not want to remove invasive alien trees, because they view them as sacred, and they do not want to remove all invasive aquatic weeds, because of the subsequent loss of diversity of bird life in the area.

Among the members of the public, even those individuals who expressed what could be termed as positive environmental values, in that they are concerned with the preservation of nature, sometimes oppose management plans that propose to eradicate or control IAS, and this opposition is not congruent with their environmental values. In these cases, says Festinger (1957:3), individuals tend to feel psychologically uncomfortable with inconsistency, and they will then attempt to reduce it. Stating his theory in simpler terms, Festinger says that “cognitive dissonance can be seen as an antecedent condition which leads to activity oriented toward dissonance reduction just as hunger leads to activity oriented toward hunger reduction” (Festinger, 1957:3). This could possibly explain why, once people have been informed of the presence of IAS and their negative impact, some of them request educational presentations that can teach them more about the issue. Generally, these educational presentations have been sufficient to gather support amongst the public for the management plans proposed by the authorities.

However, the theory of cognitive dissonance excludes those individuals who oppose management plans, not because they disagree that IAS are a major threat to indigenous biodiversity, but because they are of the opinion that that some species, despite their negative impacts, have a place in the country. Consequently, they still oppose management plans, despite being provided with the relevant information on the issue. This implies that simply providing information may not be sufficient, and further measures need to be taken in order to resolve existing conflict and prevent possible future conflicts. In many of these cases the individual does not hold negative environmental values, and generally believes that conserving nature is an important matter.

CHAPTER 5 – CONCLUSION

5.1 No collaboration means no consensus

Public involvement in environmental decision making has proliferated on a global scale, and collaboration between stakeholders has become the preferred approach to deal with environmental conflicts and the process of decision making (Daniels & Walker, 2001). As mentioned in Chapter 2, one of the primary aims of this study is to investigate whether disputes involving the management of IAS in South Africa are understood and adequately managed, specifically in line with a collaboration and consensus-based approach.

From the results presented in the previous chapter it can be deduced that, in both the case of the management of mallard ducks and of pine trees, not all the criteria of the collaborative-learning (CL) model and the trinity-of-voice model are met. This will be explained in the following two sections.

5.1.1 The collaborative-learning model

Comprising two triads, the CL model sets out to aid in understanding environmental conflicts and stakeholder-group involvement (Walker, Daniels & Emborg, 2008:17).

In both the case of the pine-tree conflict and the mallard-duck conflict, the tangle triad can be used to characterise the conflicts, as they both present elements that define the triad, i.e. “complexity, controversy and uncertainty” (Walker, Daniels & Emborg, 2008:18). As the results presented in the previous chapter illustrate, both of the conflicts are complex, involving many different interest groups. In both cases, many stakeholder groups have an interest in the way the respective species are managed, and their preferences in terms of management approaches often clash. This was more apparent in the case of the pine trees, as many more stakeholder groups were involved than in the case of the mallard ducks.

Since many interest groups are engaging with one another, these conflicts become controversial, as several different perspectives come into play. This is congruent with the social constructionist approach (Hannigan, 2006:63), as differing perspectives are a result of the different ways in which individuals construct a species and the issue of IAS in general (Walker *et al.*, 2008:19). The results generated by this

study support Daniels and Walker's (2001:258) conclusion that culture, history, ethics and personality are possible factors that contribute to varied viewpoints. In the case of the pine trees, it was clear that the long history of the trees in South Africa, as well as their aesthetic appeal, were the main motivations for the viewpoints held by public-stakeholder groups. In the case of the mallard ducks, on the other hand, the study clearly showed that moral values far outweighed any other factors underlying public-stakeholder groups' views.

The last defining element of the tangle triad is uncertainty. Different sources of knowledge frame opinion on IAS. For the scientists and managers, the source of this knowledge is primarily scientific, while the public-stakeholder groups' sources of knowledge vary greatly. Some reported that they acquired basic knowledge about IAS at school or university, while others learnt through word of mouth, but for most of them the most dominant source of knowledge on IAS is the media, and primarily what they read on the Internet. In both the mallard-duck and pine-tree cases, stakeholder groups expressed concerns relating to uncertainty, i.e. about what they know about IAS. Most members of the public-stakeholder groups reported being unsure about the extent to which they were correct about the effects of IAS; to them it is rather something they believe. Managers also expressed levels of uncertainty when they reported that, since they are still in a "learning phase" of determining how to best manage different species, what they consider a correct approach at present could transpire to be wrong at a later stage, once more research has been conducted.

According to Constanza and Cornwell (1992:15), it is important that, during the process of environmental decision making, stakeholder groups be made aware of the uncertainty that is inherent in knowledge of the environment, regardless of the source knowledge. It was surprising that, in the TMNP PMP meeting, uncertainty was at times acknowledged by the Park Manager, not necessarily only with regard to the IAS-management aspect of the park, as he did not provide explicit details of the IAS management plans, but rather gave a brief overview. In terms of managing other aspects of the park, however, when uncertainty was present amongst both management and the public, this was acknowledged, and the public were urged by the Park Manager to refer to it in their feedback forms, to allow the managers to consider the relevant issue in more depth and to attempt to obtain a clearer picture in order to produce more efficient management plans. On the basis of the apparent uncertainty among both the public and managers, one may argue that the tangle triad is a suitable

frame for understanding the conflicts involving pine-tree- and mallard-duck management in Cape Town, as each of its defining features is present in both cases. Walker *et al.* (2008:19) state that understanding a conflict through this frame can help identify paths that could potentially lead to progress in quality decision making, by addressing the elements of complexity, controversy and uncertainty.

This leads one to the second frame of the CL model: the progress triad. This frame sets out to identify where along the decision-making process improvements can be made (Walker *et al.*, 2008:19). In the progress triad, a conflict is broken down into different parts, all of which are interconnected. Therefore, an improvement in one aspect of the conflict is likely to result in an improvement in another aspect (Walker *et al.*, 2008:19). This becomes apparent when applied to the conflicts regarding IAS that are considered in this study. In order for progress to be made in resolving a conflict, improvements need to be made in different parts of the conflict.

In the case of the mallard duck, for example, the conflict began within ten hours of the residents learning about the management plans that were to be enforced the following day. When managers met with physical opposition from the residents the following day, despite attempts to talk to the residents, it was realised an alternative route needed to be taken. The services of a professional communicator were therefore enlisted to improve the communication-flow aspect of the conflict. Improving the flows of communication sheds light on the methods of communication that the residents had a problem with, in particular the underlying message of the campaign to remove the mallards, which was to exterminate them. Changes were then made to the campaign: instead of promoting the eradication of mallard ducks, the public were informed that South Africa's indigenous waterfowl would be saved.

The level of awareness of the negative effects of mallard ducks brought about by the campaign did not change, as the public were still uninformed on how to distinguish a mallard duck from waterfowl indigenous to South Africa. With the modified wording, however, the response to the campaign was more positive and met with less opposition. Improvements in these aspects of the conflict have resulted in an improvement in the relationship between the managers and the residents, which allows the managers to increase their efforts to manage the mallard ducks. Since all aspects of a conflict are interrelated, as Walker *et al.* (2008:19) suggest, improvements need to be made in all those aspects in order to make progress in the process of resolving a conflict.

Although this study focused on only two cases of conflict concerning the management of IAS, findings suggest that the frameworks used in the CL model, namely the tangle triad and the progress triad, can be applied in the analysis of an IAS-related conflict. The CL model is a particularly useful model to use with regard to IAS conflicts, as it strongly emphasises the importance of communication between different stakeholders through “dialogue, argument and negotiation” (Walker *et al.*, 2008:20). As described in the previous chapter, communication is the most crucial element in dealing with IAS conflicts. As stated before, the intention of this study was not to use these frameworks to resolve to the conflicts in question; however, possible routes to consider did emerge during the course of the research and these will be explored in more detail later in this chapter, as a recommendation for future research.

5.1.2 The trinity of voice model

The application of the CL model, as outlined above has shown that a collaboration and consensus-based approach would be a viable one to follow when dealing with conflicts regarding IAS management in South Africa. Next, the TOV model, which considers the role played by each stakeholder in a conflict, was used to determine whether the participation process during conflict management was efficient and effective. This was achieved by determining whether public-stakeholder groups exhibit the three components of the TOV model: access to minimum resources, sufficient standing, and influence. The results presented in the previous chapter show that the platforms that were once in place which allowed, at least potentially, for these criteria to be met, have fallen away. According to the managers, most environmental organisations tasked with the management of IAS used to have a “people’s forum” where members of all different stakeholder groups were able to meet and discuss management plans. It created a medium through which members of the public and interest groups could put forward their opinions and have an opportunity to be part of the decision-making process. The intentions of this people’s forum, according to manager participants, was to provide the public-stakeholder groups with the opportunity to effectively participate in the decision-making process, as they would have access to the three criteria of the TOV model.

When asked why the people’s forum was not in existence any more, most managers responded in a similar way: “it somehow fell away over time”; “the person

in charge changed jobs”; and “I don’t really know whose responsibility it is”. In each case the platform that had once been erected is no longer in place, and there are no longer formal meetings at which members from various stakeholder groups can come together to discuss management plans with the managers.

Therefore, it is clear that efforts to promote stakeholder engagement in the decision-making process with regard to IAS management are inefficient and ineffective in the sense that they not meet the criteria set out by the TOV model. One of the main principles of the TOV model is that the decision-making process be transparent from beginning to end. Ironically, one of the main critiques levelled against environmental organisations by the public was that this process is not transparent and they are often not aware of management plans until they are carried out. This is surprising, as all the managers emphasised the importance of maintaining transparency throughout the decision-making and implementation processes. This leads one to conclude that there is probably a disconnect in the flow of information, which yet again raises the issue of communication.

It is clear from the data generated by this study that, although the way in which these conflicts are dealt with in Cape Town are not in keeping with the criteria set out for collaboration and consensus-based models, management authorities are intent on incorporating as many stakeholder groups in the decision-making process regarding IAS management as they can. However, the inefficient flow of communication poses the largest obstacle in this regard. This finding is further supported by concerns raised at the TMNP PMP meeting by members of the public about the management plans proposed for the Park for the next ten years. According to many of the attendees who are members of the public, the meeting was not sufficiently publicised: if they had not come across an announcement by chance, they would not have known about it. The Park Manager, however, was under the impression that the means through which the meeting was advertised were sufficient. This again points towards the issue of communication, which will be explored in more detail later in this chapter. Observations made at the TMNP PMP further confirmed that members of the public and representatives of various community collectives felt that the issue that needed to be addressed as soon as possible was that of communication, and in particular the severe lack thereof.

5.2 Communicate to educate and vice versa

While an abundance of academic research has been conducted on environmental communication (Allan, 2002; Allan, Adam & Carter, 2000; Cox, 2010; Corbett, 2006; Depoe, Delicath & Elsenbeer, 2004; Hansen, 2011), it remains a challenge for researchers and IAS managers to attempt to keep abreast of the rapid changes occurring in both the fields of communication and the natural sciences (Hansen, 2011:10). As technology has advanced, the past two decades have seen radical improvements in communications and a vast expansion of the audiences that may be reached (Hansen, 2011:10). Concurrently, says Hansen (2011:11), there have also been changes in the processes through which claims are made, altering the power dynamics between the public and IAS managers, and therefore giving the public a more robust standing of civil legitimacy when it comes to media communications. As such, the opinions of the public are given more consideration, as is congruent with the “standing” element of Senecah’s (2004:26) TOV model. This is supported by my study, in particular my analysis of the many strongly worded newspaper articles that have been published nationwide. Members of the public are demanding answers to their questions about management plans; they are revealing the lack of transparency and holding IAS managers accountable for actions they believe were unnecessary.

Although this study is based on a relatively small sample of participants, the findings suggest that the greatest cause of conflict regarding the management of IAS in the Cape Town area amounts to a lack of communication between and within various stakeholder groups. Therefore, a strategic improvement in lines and methods of communication that are used would bring about more inclusive decision making, and ultimately decrease the frequency and severity of conflict concerning the management of IAS. Managers participating in this study all agreed that this is an avenue that environmental organisations in Cape Town need to explore if they are to manage disputes more efficiently and build stronger relationships between environmental organisations and interest groups consisting of members of the public.

Nevertheless, it has to be noted that attempts to not only increase the flows of communication, but to render existing methods of communication more effective, are currently being undertaken by environmental organisations in Cape Town. The SANParks PMP meeting is an example thereof: an active attempt to involve the public in drawing up plans to manage TMNP as a whole, with some focus on IAS

management for the next ten years. This is being done, according to the Park Manager, in order for members of the public to gain a sense of inclusion, as though they are part of the Park; so they can “feel like they are roaming their backyard” instead of actively entering the boundaries of the Park. Perhaps this is being done to lessen the in-group vs. out-group sentiments that prevail, and to allow the public feel that the park, and its nature, are not separate from them.

One could also interpret this as a way for the more powerful group – IAS managers – to surreptitiously exercise their influence over members of the public. This is consistent Durkheim’s (1982:54) thoughts on social facts: he posits that when individuals are part of a collective, they are less likely to notice the coercive power exerted on them from an external source. Considering the very small and unrepresentative group of 16 members of the public who attended the meeting, the intentions of SANParks are not divulged, because they are not being adequately communicated. Due to the poor attendance of the meeting, SANPark’s efforts to attract a representative selection of the public who are interested and/or affected fell short.

As highlighted by an attendee from the public, the methods of communication were insufficient in reaching the intended audience (i.e. those with an interest in the TMNP management plans), as most of those who were in attendance came across the information of the meeting by chance while engaging their social media accounts. Members of the public who attended the meeting suggested that SANParks broaden their communication channels, as they are currently ineffective in reaching their intended audience. Specifically, it was suggested that SANParks use radio, social media (such as Facebook, Twitter and Instagram), television, emails, text messages and posters on streetlamp poles, and make use of existing networks of interested community collectives in order to convey the information and attract a more representative selection of the interested public.

It is important to note that, along with improved lines and methods of communication, environmental education regarding IAS needs to be incorporated into school curriculums and be made available to adults who have completed their school education. Efforts to achieve the latter are being made, usually by relaying information about species targeted in the respective area for which there management plans are in effect. IAS managers anticipate that, if these are expanded upon to become monthly events across various communities and areas for all those who are

interested, the instance of disputes will drastically decrease. Based on managers' experience, if people are more educated on the issue of IAS, they are more welcoming of the proposal for management plans, campaigns and other messages being communicated to them. And the way to expand their knowledge of IAS is through improving communication between them and environmental organisations. Therefore communication and education go hand in hand, and focusing solely on one or the other will not result in improved management of conflicts, as the criteria for effective collaboration and consensus-based methods of dealing with conflicts will not be met. As mentioned above, the intention to employ a collaboration and consensus-based approach to dealing with conflict involving IAS is present, but insufficient and ineffective communication amongst various stakeholder groups prevents the criteria of such an approach to be met. However, if the dogmatic fabric upon which invasion biology has been built persists, one cannot say for certain whether the use of collaboration and consensus-based framework would result in improved public inclusion in decision-making processes and, subsequently, less conflict.

5.3 Limitations and shortcomings

Several limitations and shortcomings of this study need to be highlighted. Firstly, I could not, prior to the termination of the people's forum meetings mentioned in Chapter 4, access as potential participants in the study those who had participated in one or more of the forum's meetings. Therefore, efficacy of the forum as a platform which meets all the criteria set out by the TOV model could not be investigated and assessed. As a result, no recommendations as to changes that should be made to promote the efficacy of the forum, should it be reinstated, can be made on the basis of the results of this study.

The scale of this study was rather small as the objective was to conduct a qualitative study to attain an in-depth understanding of conflicts involving IAS. It is therefore recommended in the next section that further research with the same or similar objectives be conducted on a larger scale and across different geographic locations within Cape Town. It was unfortunate that the SANParks PMP meetings that took place in other locations within Cape Town were not well publicised and therefore did not reach me, and most of the intended audience, until they had already

taken place. It would have been interesting to record the number and demographic profile of the attendees at different meetings. Those who attended the one meeting where I was present were all white individuals, most of whom were males above the age of 45 years. The perspectives of different racial groups on communication and education regarding IAS would have added to the richness of the data. Since I was not informed of those meetings and consequently did not attend, I have no way of telling whether members of different racial groups attended them.

After an eruption of conflict has been contained, many of the opposition groups that were erected on social media platforms, such as Facebook, are deleted. It is evident here that timing is key in order to come across such a group. During the course of my research, I did not observe any major flare-ups on social media platforms in the case of the pine-tree or mallard-duck conflicts. One page was created on Facebook to “save the mallards”, but the page was deleted a day later when managers had the opportunity to listen to the opinions of the opposing group via the services rendered by the science communicator mentioned in Chapter 4. After conversing for four hours with the opposition, the professional communicator was able to relay the opinions of the opposition to the IAS managers, who agreed to include them in their management plans. The creation of the page was only brought to my attention after the page had been removed.

I was unable to convene IAS-manager participants in the same location at the same time and was therefore unable to conduct a focus group during which managers could engage with one another. The same applies to the members of the public that participated in this study: when asked if they would be interested in taking part in a focus group discussion, they said they were unwilling to do so. This is unfortunate, as focus groups would have added to the richness of the data generated, as well as provide a comparative advantage by allowing participants to engage with one other and thereby revealing the similarities and dissimilarities between their thoughts and experiences (Babbie & Mouton, 2001:292).

The searches conducted on social media and newspaper databases involved certain keywords described in Chapter 3. I may have overlooked articles or Facebook posts that did not contain those keywords but addressed the topic of concern. This is more likely in the case of newspaper articles: as articles are searched using words that are present in the title of the article, journalistic styles of writing that often include a

play on words to capture attention may result in the absence of selected keywords in the title.

One participant insinuated that newspaper companies may have an interest in maintaining conflict between environmental organisations and interested and/or affected members of the public. His reasoning is based on the assumption that newspaper companies want their newspaper to be used as a platform for debate and subsequently reach a wider audience, produce interesting stories and sell more papers. Although at this point there seems to be no evidence of this, as local newspapers have printed stories reflecting both the successes and the failures of environmental organisations' management of IAS. This is not to say, however, that presenting both sides of the debate does not constitute maintenance of the conflict. This allegation would also be difficult to prove, as it may simply be that the newspapers are reporting on a matter of concern to the public, with no intention of maintaining conflict. Based on the newspaper articles analysed in this study, it appears as though the newspapers are interested in reporting both sides of an IAS-related argument, as organisations mentioned in letters from the public are often given the opportunity to respond to claims. Unfortunately the data I gathered is insufficient to investigate this assertion in more detail.

5.4 Recommendations

A fruitful area for future research would be to investigate the possibility of developing, alongside IAS managers, a nation-wide platform, as mentioned in the previous chapter. Participants expressed great enthusiasm about this as a potential endeavour. Such a platform could greatly decrease the intensity and the number of smaller-scale conflicts that occur between and within environmental organisations and government departments, as these are generally caused (quite unnecessarily, one may argue) by a lack of communication regarding management agendas for specific species or locations. It is anticipated that larger-scale conflicts would be too complex to be facilitated by such a platform, and many rounds of negotiations between affected stakeholder groups will be needed to decrease the scale of the conflict and to hopefully reach a compromise or consensus between all stakeholder groups. Further work is required to establish the viability of a nation-wide platform as an appropriate

and effective solution to improve the communication gap that appears to be evident between and within various interest groups regarding the management of IAS in South Africa. It is currently unclear whether environmental organisations in South Africa, and Cape Town in particular, have the capacity to meet the requirements necessary for a full deployment of effective collaboration and consensus-based frameworks. In future investigations, it may be useful to include as participants those scientists involved in academic research on IAS, as their perspective on conflict involving the species has not been considered in this study, and they may add interesting insights on the matter.

It is recommended that further research be undertaken to explore education regarding IAS. It would be fruitful for future research to examine environmental education in South Africa, with a focus on IAS, to suggest syllabus content and how it should be included in the national syllabus, and thereby to identify any gaps and ways in which they can be filled (e.g. with physical activities, such as field trips, as suggested by one of the participants).

It is recommended that this study be used as an exploratory first step upon which to expand to a much larger scale, by including a more representative sample of the South African public. Perhaps it could serve as the first of a range of comparative studies to be conducted in various cities within South Africa, to determine how conflicts are managed in different locales, and the unique conflict-management challenges that are faced in each. Such a series of studies could have a strong potential to inform future policies to assist in reducing the frequency of conflict situations.

This research extends our knowledge of how conflict situations that arise regarding the management of IAS in Cape Town are being managed, both within and outside the bounds of protected areas. It can serve as a point of departure for studies aimed at exploring ways to improve the management of conflicts by describing the types of conflict that can prevail, as well as the reasons conflicts persist. This research makes several noteworthy contributions by answering questions that have not yet been addressed in the South African context. This study builds on the current paucity of data on human elements within IAS management in South Africa, with a specific focus on engaging with various stakeholders. This is of great importance, as these multiple stakeholder groups pose one of the largest barriers to effective IAS management in Cape Town. Despite its relatively small sample size, this is one of the

few empirical studies to systematically consider good practice in knowledge exchange and conflict management regarding IAS in South Africa.

Hopefully what this study has achieved in terms of identifying how various respondents have socially constructed IAS will be helpful to researchers who are able to take this research a step further by, for example, identifying how social constructions are developed, or by determining whether social constructions of IAS by various participants have changed over time.

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ADDENDA

ADDENDUM 1

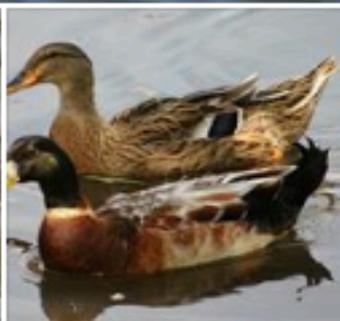


Cape Town Invasive Species added 6 new photos to the album: City moves to educate residents on **Mallard Duck** invasion.

October 28, 2013 · 🌐

The City of Cape Town has launched an educational campaign to inform residents of the threat exotic mallard ducks pose to our indigenous ducks.

South Africa's top avian scientists together with local invasion biologists and conservation managers have for many years warned that the invasive alien **Mallard Duck** poses a very real threat to the country's indigenous **Yellow-Billed Duck**. To read more about this initiative, click on this link:<http://www.invasives.org.za/.../557-city-moves-to-educate-res...>



Like · Comment · Share

Mallard

(*Anas platyrhynchos*)

Mallards are a threat to the survival of our South African waterfowl

Mallards are a particularly unwelcome invasive alien species in South Africa where they are known to hybridise with species from the genus *Anas* (nine species in Southern Africa), including the Yellow-billed Duck (*Anas undulata*), African Black Duck (*Anas sparsa*) and Cape Shoveler (*Anas smithii*). Mallards pose a serious threat to indigenous duck species in many countries around the globe, with lessons learnt from countries such as Hawaii and New Zealand. These threats include competitive displacement, disturbing water quality and hybridisation. The problem is exacerbated when hybrid offspring are fertile, as in the case of the Mallard and Yellow-billed Duck.



Male (above)

- **Bill:** Lemon-yellow throughout the bill.
- **Legs and feet:** Orange.
- **Head and neck:** Shiny green head with a narrow white collar just above the chest.
- **Body:** Chestnut-coloured breast with light grey sides and wings. There is a purple patch on the lower wing.
- **Tail:** Males have a characteristic curled tail.



Female (left)

- **Bill:** Light grey bill, often with yellow infusions.
- **Legs and feet:** Orange.
- **Head and neck:** Light brown to grey with darker black streaks. There is often a distinct white eyebrow stripe above the eye with a darker stripe running through the eye.
- **Body:** The plumage is light brown with darker black infusions throughout the wings and body. On the lower wing is a dark blue speculum – a purple patch bordered by white.



Water Affairs
Agriculture, Forestry and Fisheries
Environmental Affairs



Identification of Mallards

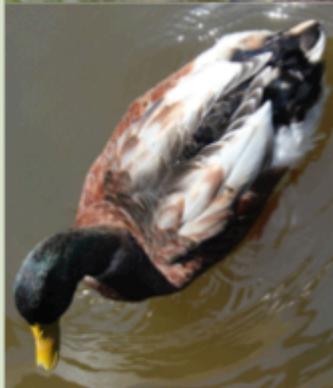
Male, female and hybrid Mallard characteristics to look out for...



TRUE MALLARD MALE: Green head, yellow bill and white collar, just above the chest.



TRUE MALLARD FEMALE: Look for the lighter eyebrow stripe and dark stripe along the eyes.



HYBRID MALLARDS: White quackers and ducks with orange-coloured feet are defined as Mallard hybrids.



Invasive male Mallard: With curly tail



Indigenous Yellow-billed Duck: No curly tail

CURL OR NO CURL: Male (drake) Mallards have curly tails.

What does the law say?

Under the National Environmental Management: Biodiversity Act (NEM:BA) No. 10 of 2004, Mallards are designated as a Category 1b Invasive Alien Species.

This legislation states that:

- No person may import, trade or breed Mallards.
- Mallards need to be managed as part of an invasive control plan.
- Once the control plan has been adopted in an area, no person may, without a permit, possess any Mallards.



Report Mallard sightings to www.ispot.org.za

Never mistake the Mallard for the following indigenous ducks:

African Black Duck



Yellow-billed Duck



Cape Teal



Save our indigenous waterfowl

ADDENDUM 2

Dear [*insert name of group administrator*]

Thank you for allowing me to join [*insert name of group*], I appreciate it. I am looking forward to receiving updates like the ones I have seen on the group wall and I wish I had joined sooner.

I am a Master's student in the Sociology and social anthropology department at Stellenbosch University and my current focus is on situations of conflict or opposing views concerning invasive alien species in Cape Town. This includes both animal and plant species. I would love to know if you have had any experiences with invasive alien species in Cape Town and if you are in support of actions that are currently in play to control these species (e.g. the removal of pine trees from Table Mountain National Park or the removal of mallards from various locations in Cape Town). If you oppose any of the control actions or plans I would be very interested to hear your story. Also, if you are willing, please suggest any similar groups in Cape Town you are aware of or have the contact details for.

[*In the case of a response*] Do you think it would be possible to perhaps post something on the group wall giving a brief introduction to my study and asking the members if they have any opinions on the way invasive alien species are managed and if they would like to get in contact with me to share their thoughts? I don't want to overstep any boundaries and I would like to have your consent regarding anything I post on the wall relating to my thesis.

Thank you for your time and consideration.

Kindest regards
Laura Caetano
17422965@sun.ac.za

ADDENDUM 3

NOTICE TO TABLE MOUNTAIN NATIONAL PARK STAKEHOLDERS



Notice is given to all interested and affected parties that in terms of section 39, read with section 41 of the National Environmental Management: Protected Areas Act No. 57 of 2003 (NEM:PAA), SANParks is revising the park management plan for Table Mountain National Park (TMNP). The TMNP management plan is also being revised in terms of section 21 of the World Heritage Convention Act No. 49 of 1999 as the Park forms part of the Cape Floral Region World Heritage Site.

The purpose of the park management plan is to guide the future management of the National Park for the period 2015 – 2025. The NEM:PAA requires that interested or affected persons be given the opportunity to comment on the plan.

Please note, you are required to register in order to participate in this process by accessing the SANParks website at www.sanparks.org/conservation/park_man/forms/reg_form.php. You can also register by telephone or post (see contact details below) and at the public information sessions. The stakeholder participation process will run from 16 February to 28 March 2015.

An electronic version of the management plan is available on the SANParks website www.sanparks.org/conservation/park_man/draft_plans.php from 16 February 2015. The plan can also be viewed at the following locations.

Athlone public library	Khayelitsha public library
Bellville public library	Kloof Nek office, TMNP
Boulders visitor centre, TMNP	Langa public library
Cape Town: central library	Mitchells Plain, Town Centre public library
Claremont public library	Mowbray public library
Fish Hoek public library	Simon's Town public library
Grassy Park public library	Tokai Manor office, TMNP
Gugulethu public library	Tokai public library
Hout Bay public library	

Stakeholders are further invited to attend public information sessions at one of the venues listed below and comment on aspects relating to these plans.

Park	Date and time	Venue
TMNP	02 March 2015 (15h00 – 18h00)	Roman Catholic Church, Pokela Road, Masiphumelele
	03 March 2015 (09h00 – 12h00)	SANParks Cape Research Centre, Upper Tokai Road, Tokai
	03 March 2015 (15h00 – 18h00)	Hout Bay Library, Melkhout Crescent, Hout Bay
	04 March 2015 (09h00 – 12h00)	Simon's Town Museum, Court Road, Simons Town
	04 March 2015 (15h00 – 18h00)	Newlands Conference Room, Newlands Forest Station, Union Avenue (M3)
	05 March 2015 (09h00 – 12h00)	Fish Hoek Civic Hall, Central Circle, Fish Hoek
	05 March 2015 (14h00 – 17h00)	Cape Town Central Library, Drill Hall, Darling Street, Cape Town
	06 March 2015 (09h00 – 12h00)	Edith Stephens Nature Reserve, Govan Mbeki Road, Philippi
	07 March 2015 (09h00 – 12h00)	Khayelitsha Resource Centre, Makabeni Road, Khayelitsha
07 March 2015 (13h00 – 16h00)	Rocklands Minor Hall, Cnr Spine & Park Roads, Rocklands, Mitchell's Plain	

Written comments are to be forwarded either electronically or by mail to André Spies by 28 March 2015.

André Spies
 Postal address: SANParks, P.O. Box 787, Pretoria, 0001
 Tel: 012 426 5212 Email: andre.spies@sanparks.org

ADDENDUM 4



REVIEW OF PARK MANAGEMENT PLAN
 Stakeholder Registration Form
TABLE MOUNTAIN NATIONAL PARK

South African
NATIONAL PARKS

STAKEHOLDER DETAILS

TITLE	NAME	SURNAME	
ORGANISATION		POSITION	
ID NO		TEL NO	FAX
CELL NO		E-MAIL	
POSTAL ADDRESS		POSTAL CODE	

PLEASE INDICATE THE SECTOR YOU REPRESENT OR YOUR SPECIFIC INTEREST BELOW

Description	Tick	Description	Tick
Local Government		Research	
Provincial Government		Education	
National Government		Conservation	
Traditional Authority		NGO / CBO	
Local resident		Tourist Association	
Land claimant		Tourism Operator	
Park Forum representative		Park Visitor	
Local Business		Water Committee	
Business Associations		Tourism Operator	
Media		Other	

- Are you participating as a representative of the above organisation or in your individual capacity?
- What is your specific interest in being part of the Park planning process.....
- What will your contribution to the process be?

I will be actively participating in the comment process of the Park Management plan in the following manner: (please tick the appropriate box.

<input type="checkbox"/> I will be attending the meeting once the date is announced	<input type="checkbox"/> Providing a written response on the Park Management Plan <input type="checkbox"/> Please send me the SUMMARY document via
<input type="checkbox"/> The following person will be attending on the organisations behalf	<input type="checkbox"/> My e-mail address <input type="checkbox"/> My postal address <input type="checkbox"/> I Will access the SANParks website
<input type="checkbox"/> I am not interested in commenting on the Plans, but would like to remain on the Parks database	
<input type="checkbox"/> Please remove me from your database – I do not wish to receive further correspondence from SANParks.	

Thank you for your participation!

ADDENDUM 5



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

STELLENBOSCH UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH

Environmental conflict and its resolution: The case of invasive alien species in Cape Town, South Africa.

You are asked to participate in a research study conducted by Laura Caetano, registered for Master's (Sociology) in the Department of Sociology and Social Anthropology at Stellenbosch University. The results of this study will contribute to her thesis. You were selected as a possible participant in this study because you are employed by an environmental organization to implement management plans to control pine trees and/or Mallard Ducks in Cape Town.

1. PURPOSE OF THE STUDY

This will be a study aimed at exploring the current conflict between environmental managers tasked with the control of pine trees and/or Mallard Ducks and various members of the public who oppose environmental manager's attempts to remove pine trees and/or Mallard Ducks, and wish to rather preserve these species.

2. PROCEDURES

If you volunteer to participate in this study, you will take part in an individual interview with the researcher at a time and place that suits you.

I will explain the potential risks and inconveniences participation might bring you. I will explain how this study could benefit IAS managers. I will explain how the information collected will remain confidential. I will explain how you may withdraw your consent at any time.

The length of time for participation is anticipated to be an hour, although this may vary.

3. POTENTIAL RISKS AND DISCOMFORTS

There exists the possibility that you may be inconvenienced by the time taken to conduct the interview. To minimize this risk, interviews will be scheduled for a time that best suits you.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You will not receive any payment for your participation, nor will you directly benefit in any other way from this research.

5. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of transcribing the interview and/or focus group discussion into an electronic document which will be protected by a password, along with the digital recording, that only I and my supervisor will have access to. All hard copies of the transcriptions will be kept in a locked desk drawer, along with an external hard drive containing a back-up of the electronic transcriptions as well as the digital recordings, which only my supervisor and I will have the key to. Only we will have access to the data collected.

6. PARTICIPATION AND WITHDRAWAL

You can choose whether to participate in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so. Your participation will be terminated if you are 18 years old or younger.

7. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me at 083 443 1655 or my supervisor, Dr. H.E. Prozesky on 021 808 2092.

8. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at Stellenbosch University's Division for Research Development.

SIGNATURE OF PARTICIPANT

The information above was described to me in English by Laura Caetano and I am in command of this language. I was given the opportunity to ask questions and these questions were answered to my satisfaction.

I hereby consent voluntarily to participate in this study. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF RESEARCHER

I declare that I explained the information given in this document to _____
[*name of the participant*]. [*He/she*] was encouraged and given ample time to ask me any questions. This conversation was conducted in English and no translator was used.

Signature of Researcher

Date