

Born to Be Wild: Tiger Persecution and Advocacy
From 1800 to the Present

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ABSTRACT

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Katheryn Malcolm Norris

The tiger (*Panthera tigris*) was once abundant in many of Asia's forests. The entire species now hovers dangerously close to extinction. Population declines within the last two centuries are blamed largely on loss of habitat, reductions in prey species, poaching, and human-tiger conflict. Modern tiger conservation efforts focus on reintroducing formerly captive tigers to designated protected wild areas. Re-wilding and reintroduction programs teach survival skills to tiger cubs raised in zoo collections. Merging *in situ* and *ex situ* research collaborations is the twenty-first century's interdisciplinary answer to the tiger's plight in the wild. The zoo is viewed in terms of its role as an institution that represents societal values that shift in concurrence with shifting paradigms.

This thesis studies the human-tiger relationship and analyzes three defining periods that occurred between 1800 and the present. The first period occurred during the nineteenth century, the second took place from the early through the late twentieth century and the third picked up where the second left off and is the one we are presently engaged in. The tiger is investigated in two different ways throughout – for its importance in human history and culture conceptually, and in the biological sense in terms of its importance as umbrella species within its own ecosystem.

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Do not cut down the forests with its tigers and do not banish the tigers from the forest. The tiger perishes without the forest, and the forest perishes without its tigers. Therefore the tigers should stand guard over the forest and the forest should protect all its tigers.

From the *Mahabharata*, Udyogaparvan, 29, 47-48 (circa 400 B.C.E.)

INTRODUCTION

A mechanical model of a tiger eating an Englishman stood on display at the British East India Company in the early-nineteenth century. Each visitor to crank the handle was rewarded with the sounds of a roaring tiger mingled with agonized human distress cries. This artifact, dubbed “Tipoo’s Tiger,” drew crowds for generations. It was later on display in museums throughout London. The scene was the depiction of an actual tiger attack that occurred in 1793, when the young son of General Sir Hector Munro was attacked in the mangrove forests of Bengal.¹ Public fascination with this object, according to one source, indicates an equal mixture of repulsion and fascination for the tiger’s equally paradoxical savage beauty. The tiger’s form in its absentia elicited admiration. However, tigers in the flesh sometimes attack people, and with each instance, fear built within the human mind and exacerbated the problem. Many believed that once tigers tasted human flesh, they kept coming back for more.² People carried these beliefs with them through several centuries.

Paradox is one significant aspect of how humans have perceived tigers throughout history. Examining this relationship forces us to examine facets of our own wild nature, and reconcile the paradoxical nature of our perceptions of the wild tiger. It can also help us to devise strategies for triangulating conservation approaches as we work on saving, or recreating, the wild tiger.

¹ Anand S. Pandian, “Predatory Care: The Imperial Hunt in Mughal and British India,” *Journal of Historical Sociology* 14:1 (79-107), 2001.

² Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age*. Cambridge: Harvard University Press, 1987; Pandian, “Predatory Care,” 2001.

While this thesis discusses particular aspects of both human and tiger traits, it does not study either one in isolation. As the human-tiger relationship is analyzed, significant historical tensions over the past two-hundred years are also highlighted. Throughout their shared history, confrontations between humans and tigers have been predominantly violent. Communication between the two species is largely ineffectual and most encounters occur with both parties acting offensively. This is understandable, given the nature of both species. Since the tale can only be told from the perspective of the human, a large concentration of the evidence must be understood through social, cultural, and economic dimensions of the period.

Three periods within the past two-hundred years are presented in this thesis, and through them, three tigers: past, present, and future surface. The tiger of the first period (tiger of the past) is classified as wild and untamed. The tiger of the second period (tiger of the present) is best described as controlled; it is not wild; nor is it tame. The change in the tiger, from wild to controlled, was caused by both direct and indirect interference of human action and activity. The tiger of the third period (tiger of the future) is a hybrid of the first two – it may possess wildness but this hinges in large part on the intervention of the human.

The three periods represent our historical and lingering perceptions of the tiger. These perceptions are divided into three commensurable categories. These are:

- 1) man-eating (or alpha, or profane)
- 2) scientific (or biological)
- 3) conceptual (can also be called sacred or mythological)

The limits are malleable – they are not rooted within a single category by any means. There is ample crossover, and evidence that all three perceptions exist to some degree in every period. The categories are useful for understanding how humans have

treated tigers in the past, and how we treat them to this day. Two or more conceptual beliefs about the tiger can exist within the same period, community, or even the same individual. How we perceive tigers of the forests or the zoo can explain the innate forces that guide how we regard and treat them as individuals, and in the collective. Tigers have simultaneously been the subject of awe, fear, reverence, repulsion, ambassador and cultural pride, and unwieldy competition. One consistent quality of the human-tiger relationship is that of conflict. Scrutinizing our own perceptual baggage can enable us to intellectually explain the paradoxes within our own lack of consistent behavior – and may aid us in saving the tiger species from extinction.

The question of what an ideal relationship between humans and tigers might entail reminds us of a problem deeper than allocation of earthly space and the unwittingly compromise of the captive tiger. Increased contact between humans and tigers has, to a certain extent, de-personalized the human-tiger relationship. Experience has taught us that hungry, injured, sick, desperate -- and sometimes healthy -- tigers can be a menace to human life and interest. Further, we have inadvertently created volatile situations by interfering in the naturally wild lives of tigers.

Massive clearing of the tiger's forested domain has driven their populations closer to Indian villages and cities. Casualties of this domain war are accumulating on both sides. The tiger species is clearly faltering in its ability to rebound to the extent that every individual lost brings the tiger that much closer to the finality of a species lost. There is no question that humans overall are dedicated to the idea of saving the wild tiger. Nevertheless, much of the struggle over how to approach tiger survival is within our minds, and the poachers among us jeopardize our modern conservation goals with old practices.

The tiger is physically and ideologically meaningful to the human psyche and it is not easy to reconcile the tiger ideal with tiger incarnate. The tiger's place in our minds and societies as cultural symbol has not prevented us from waging combat against their bodies. The actions of humans have literally almost driven the tiger species to extinction in the wild. Ironically, we are now the only force that can conceivably stop this tragic outcome. However, successful conservation of the tiger will require us to modify thoughts, habits, and behaviors that have been instrumental in the definition of our human status for a very long time.

Our evolving perception of ourselves in relation to the natural world continues to influence the extent to which we value living tigers and their place in nature. The consequences of this are evident in their treatment. One of the greatest challenges that we now face is acknowledging the direct correlation between our treatment of the tiger and how we perceive their power in relation to ours. Not surprisingly, humans worldwide are uncomfortable with the idea of wild tigers roaming unrestrained and uncontrolled. Yet the further we are from this reality, the more tantalized we are as we imagine slinky striped bodies moving stealthily through inky black nighttime-forests as they have done for millions of years. What is the true status of the wild tiger? Are we making progress in our campaign to save the species?

It is easy for many of us to construct a vivid reality of the fruits of our efforts from fragmented pieces of knowledge, and even easier to believe in hope when it is offered. Efforts to raise funds and global awareness of the ecological importance of the tiger abound. The dramatically emblazoned tiger across every media outlet proves that a mere image is powerful enough to stir our cultural sensibilities. Unfortunately, the

decimation of the tiger continues despite these efforts. Laws alone cannot save them.

Processes that brought us to this point involved centuries of change, and it may prove very helpful to study those changes.

Investigation into the decimation of once abundant tiger populations and the tiger's significance in a captive environment portrays historically changing ideals which have led us to the hybridization of wild and captive conservation efforts. Now that we have driven their numbers to near-extinction levels, we are forced to consider the repercussions of the total loss of Asia's alpha predator. Concern for the conservation of the wild tiger and preservation of its habitat first appeared in published literature during the nineteenth century and increased in volume significantly during the twentieth century. Ecological, economic, and political, as well as moral reasons demand conservation and support for wild tiger populations.

Primary source documents written by nineteenth-century naturalists describe an awakening human awareness to the gravity of the ecological consequences for the wild tiger, and its prey species. This thesis draws support from multiple literary disciplines. These include studies that document human and tiger interactions, tiger population declines, and threats to wild tigers; environmental history, conservation goals, behavioral enrichment in zoos, reintroduction, and conservation biology. This thesis contributes to a body of literature that focuses on the growing ecologically centered movement to save the wild tiger.

While emphasizing the ecological importance of the tiger as leader of its ecosystem, the main arguments concentrate on changing elements defining a historical relationship largely constructed from the psychological attributed to tigers by humans. The

study examines the multi-faceted dilemma of reconciling the tiger in myth with the tiger in the flesh. In a contributory paper to the Property and Environment Research Center (PERC), Michael t' Sas-Rolfes posited that tiger conservation is ultimately a matter of promoting incentives that convert the live tiger into more of an asset than a liability.³ Similarly, this thesis argues that the solutions to the tiger conservation dilemma exists not in hostility, indifference, reverence, or even friendship – but a form of respect in which we strive to apply our knowledge of the tiger's ecology to improve the situation for both tigers and humans. To this end, it utilizes an interdisciplinary approach to illuminate tension and conflict between the human and tiger.

Human-tiger tension has roots as old as ancient history. Within the last seventy years, the Javan, Bali, and Caspian tiger subspecies have become extinct in the wild. Although the Sumatran, Siberian, Bengal, Indonesian, and South Chinese subspecies still exist in the wild, their numbers are declining fast. They could vanish as well if the current downward trends continue. Improvements in field study methods within the past hundred years have enabled us to increase our knowledge about the wild tiger's habits. Lately, much tiger tracking and study has focused on lack of evidence – proof that their numbers are in serious decline.

Chapter one evaluates escalating social, cultural, and political conditions that have led to the current epic tiger extinction crisis. The three primary threats to the tiger's survival today are habitat loss, poaching, and prey base decline. The chapter analyzes human perceptions about themselves in relation to the untamed wilderness. The section argues that how we perceive the wilderness and our connection to nature has, throughout

³ Michael t' Sas-Rolfes, "Who Will Save the Wild Tiger?," *PERC Policy Series*, 1998

history, influenced how we relate to and treat the wild tiger, a strong symbol of a wild life that we largely disassociate ourselves from. Studies that investigate this interrupted connection offer us insight into our sense of alienation from nature that, for many, is manifest through a need to conserve wild animals and habitats.

Chapters two through four are situated within three important periods from 1800 to the present. Paradoxical qualities of the human-tiger relationship appear throughout all three periods. They represent a progression of changing ideals and values in terms of how we view and treat the tiger as living (or non-living) commodity. As the first period shifts to the second, and the second to the third, a paradigm shift in how we think of the notion of wild is also evident. Chapter three introduces the first period, which occurred from approximately the early nineteenth to the early twentieth-century. During this most of this period, the tiger was characterized predominantly as profane and problematic. The end of the century, however, saw increasing interest the tiger as a subject of beauty and fantasy. Unfortunately, its body was widely poached for international trade. Even when declared illegal, the bustling tiger part trade boosted the tiger's human neighbors economically, on a personal and community level. Possession of tiger skins and other body parts were connected with raised social status.

Chapter two focuses on events that took place within India during British Colonial rule. Human-tiger contact during this period can be described as a struggle for land resources between two dominant predators. All eight subspecies were numerous throughout all of their ranges. As civilizations grew and flourished, men scouting the forest for its resources experienced mounting contact with tigers. Disappearing forest land caused some tigers to wander into the open to search for food and territory. India's British

government dealt with the prevalence of man-eating tigers by encouraging its citizens (and visiting tourists) to participate in a free-for-all tiger slaughter. The advent and rapid improvement of weapon technologies meant that increasing numbers of tigers could be killed with less risk to the human. Subsequent altercations occurred frequently, and intensified the wedge between human and tiger even as the clearing of forests across Asia narrowed the gap between the tiger's wilderness domain and human civilization.

Many early nineteenth-century naturalists wrote books detailing their adventures and interactions with tigers in their natural habitat. Some of these are the contribution of a few well-known men who hunted tigers in India, who came to be known as "tiger-wallahs."⁴ Their writings do not overtly promote the virtues of man over beast, nor are they devoid of ecological awareness. They do, however, paint a striking image of men stalking through the tiger's jungle lair, relying entirely upon quick wits – and the ready discharge of their weapon – to keep them alive. Their words remind us of a time of the breathless exhilaration of man battling tiger.

Journals of nineteenth-century naturalists portray their encounters with tigers as the thrilling contact with a most dangerous -- and worthy -- adversary. People's motivations for hunting and killing tigers vary. Although Jim Corbett and Arjan Singh both lived and hunted in India during its Colonial rule by Britain, they grew concerned as the tiger's habitat and the tiger itself began to disappear. Corbett and Singh lamented the negative effects of man's actions on the tiger and its habitat. At some point in their lives, both of these men traded in gun for camera and dedicated themselves to conserving the Indian forests and the tigers within.

⁴ See F.W. Champion, *With a Camera in Tigerland*, 1927; R.I. Pocock, "Tigers," *Journal of the Bombay Natural History Society* 33:3 (505-542), 1930; and R.G. Burton, *The Book of the Tiger*, 1933.

Many of the books written by India's well-known tiger-wallahs late in their lives address relations between local villagers, British rule in India, early conservationist work, and offer many fascinating observations about the habits of those mysterious tigers of the forest.⁵ An expansive body of literature promoting the tiger's conservation thus evolved from a tradition that first emerged with the journals of nineteenth-century hunters-turned-conservationists. Literature describing contact with tigers that were somehow wilder and infinitely freer than the majority of living tigers today is the only link that we can forge with the conception that those living during the nineteenth-century held of tigers in their midst. Chapter two describes a shift in perception that started with a small group of men and grew in magnitude until it had affected a notable replacement in tiger hunting technology – gun to camera. The chapter concludes with a peek into conservation efforts that started with the designation of protected habitat for the wild tiger.

Chapter three introduces the second period, which took place throughout the twentieth-century. The tiger is viewed by the scientific community and the public at large as an ecologically valuable leader of its ecosystem. Human-tiger conflict for Asian localities near reserves, and uncontrolled poaching continues to hamper conservation efforts, however. All eight tiger subspecies struggled under conditions that threatened every aspect of their vitality. The greatest damage in history to both tiger and their habitat occurred during this period, despite worldwide laws making it illegal to kill them. Three of the eight subspecies became extinct in quick succession during this period. Despite or perhaps owing to this rapid decimation, an awakening consciousness and a wish to conserve rather than destroy the tiger has intensified worldwide. A profound, shared

⁵ See Rangarajan, *India's Wildlife History*, 2001; Valmik Thapar, *Battling for Survival: India's Wilderness Over Two Centuries*. Oxford: Oxford University Press, 2003.

intention throughout the world developed out of its grassroots into a chain of internationally renowned organizations, sharing a common determination to try to prevent the extinction of the five remaining tiger subspecies.

While wild tigers dealt with their changing habitats, captive tigers also experiences changes in their surroundings. Their exhibits underwent transformations along with the overall mission of the zoological institution. Gradually, the zoo began to coordinate activities with the animals in accordance with the pursuits of the scientific community. National and international conservation work blending *in situ* and *ex situ* efforts created a hybrid conservation model that combined the efforts of science, wild area management, and zoos. Our current knowledge of the wild tiger, and of the effects of captive conditions on the tiger, grew from studies during this time. The chapter further explores tiger behavior in captivity and evaluates enrichment exercises for stimulating natural behaviors. This investigation into behavior acquisition deals centrally with the loss of natural behavior in captive-born individuals. It emphasizes that studies on wild and captive tiger behavior is central to the success of South China's conservation effort (which is the primary focus of chapter six).

Chapter four examines the third and current period, which began during the late twentieth-century and remains the predominant situation today. During the third and current period, the tiger's plight is viewed as the consequence of our paradoxical perceptions of the tiger as cultural symbol and as biological entity. The chapter examines an innovative, controversial conservation strategy taking place in South China that strives to utilize captive tigers to boost the severely impoverished South Chinese tiger population. Current tiger conservation goals in South China that focus on reestablishing the wild in the

tiger and the tiger in the wild represent a pinnacle for the human awakening to the imminent possibility of the wild tiger's extinction.

Chapter four evaluates the South China rewilding project and considers its potential success in terms of the current cultural and social climate. Rewilding training sessions aspire to establish survival and hunting skills in captive-born tigers that have never had to fend for themselves. Many captive-born tiger cubs are not raised by their mothers, and thus are denied this early education that many believe is necessary for ingraining hunting and defensive behaviors. The history of reintroductions covered in this chapter begins with the story of Arjan Singh and "Tara." The chapter briefly touches on the science and ecology of reintroductions, and questions of issues of diversity and long-term survival of the species. The chapter looks into the South China rewilding project in terms of process and progress and highlights the cultural and mythological significance of the most critically endangered subspecies right now.

The concluding chapter weaves together the ideas of this thesis by tying changing ideals, perceptions and paradoxes to the triangulation of ideas and approaches to tiger conservation that now struggle to clean up a mess of two centuries of decimation. The chapter inquires into the issue of who is ultimately responsible for the fate of the tiger and reveals fundamental quandaries related to the rewilding project. The final chapter addresses ethical concerns pertaining to the reintroduction of the tiger. Current work to repopulate South China's forests with tigers operates under the assumption that humans and tigers can learn to co-exist. Special reflection is devoted to the concerns and needs of human populations whose knowledge of what it means to coexist with tigers is first-hand, and who are also a large part of the wild tiger's survival challenges. The final chapter

includes a discussion of mythological associations that branch into current stereotypes and realities surrounding the tiger's body as a commodity.

CHAPTER ONE

THE PROBLEM: HUMAN-TIGER TENSION AND CONFLICT

The ancient tiger (*Panthera tigris tigris*) and early *Homo*

Let us take a peek back a few thousands years ago, to a time when members of the genus *Homo* lived in hunter-gatherer societies. Their very lives depended upon their knowledge of natural history. Most of their waking moments were spent aware of other living organisms within their immediate environment.⁶ Examining the prehistoric origins of human and tiger co-habitation can provide us with important clues with which to piece together the true nature of our bond with them. It may also enhance our awareness of our existing predicament. Most of our existing knowledge of pre-historic tigers comes from archaeological records.

Fossilized remains have provided scientists with important clues about the tiger's evolutionary adaptations. The tiger species evolved from the tree-climbing carnivorous mammal called *miacid* 50- million years ago.⁷ 30-million years ago, a group of cats classified as the *Pseudaelurines* appeared, fossil evidence delineates this group as an ancestor of the 37 species of cat that exist today. Jump ahead seventeen or eighteen million years and we find that the common ancestor to modern cats resembles the modern leopard. Evidence indicates that the tiger evolved before the lion, leopard, and jaguar, thus there is a wider genetic gulf between the tiger and the rest of the large cat species.

Around ten thousand years ago, *Homo habilis* evolved into an early form of *Homo erectus* and began expansion out of Africa and towards China. Did tigers exist alongside

⁶ Alan Turner, *The Big Cats and their Fossil Relatives: An Illustrated Guide to their Evolution and Natural History*, New York: Columbia University Press, 1997.

⁷ *Ibid*

this early forebear of human? It is difficult to prove by fossil record alone, because tiger and lion skeletons are virtually identical. Badly weathered skeletons make this distinction even tougher. Also, the conditions under which tigers live – in dense forests in moist, hot atmospheres, are not conducive to good fossil formation. The earliest tiger fossils have been found, respectively, in China, Java, Sumatra, (one to two million years ago), Russia and India (700,000 years ago) and Borneo (only a few hundred years ago).

All of this evidence has bred two theories. The Asian theory claims that tigers emerged out of East Asia and split into two groups. One of these went north to Russia while the other went southeast to Indonesia and southwest to India. The second posits that China was the singular origin. Scientists believe that tigers arrived in India occurred just after the last major ice age, and around the time of the extinctions of saber-toothed cats and the American lion.⁸ Although documentation describing early human-tiger interactions is minimal, there is sufficient evidence to show that the tiger was an influence in the lives of humans. For example, rock paintings depict human and animal, including a running and hunting tiger form that we can easily recognize.⁹

Significant proof of human-tiger conflict occurred during the Roman Empire, between two thousand and one thousand years ago. Here the tiger is seen as a spectacle for human enjoyment. Caspian tigers were among the many large animals that were put into the fighting arena of the amphitheaters. Many people came to see human and beast pitted against one another in this fashion. A large number of tigers were slaughtered for public entertainment during this period, and beasts were often pitted against beast. These

⁸ Valmik Thapar, *Tiger: The Ultimate Guide*, New York: Two Brothers Press, 1993.

⁹ Valmik Thapar, *Land of the Tiger: A Natural History of the Tiger*. Berkeley: University of California Press, 1997.

activities clearly mark the “first significant threat to the tiger’s existence.”¹⁰ Apart from these public spectacles, humans during this period were neither numerous nor resourceful enough to mar the tiger’s stability. Roughly two hundred years ago, physical, cultural, economic, and social influences were to change all of this, and the tiger species would never again be the same.

Where have all the tigers gone?

Tigers today are in *serious* trouble. That simple sentence aptly describes what inspires the dedicated works of many seminal scientists and conservationists. The undisputed truth today is that humans have only themselves to blame for the tiger’s plight. Almost anyone within proximity to tiger populations and the means to do so can find a way to terminate the life of a forest dwelling tiger. A point that is greatly emphasized in the literature is that true conservation efforts require that we dedicate ourselves to helping them despite the danger their existence represents to some of us. Most sources agree that repercussions from the eighteenth and nineteenth centuries created conditions of near decimation for this revered and feared alpha¹¹ predator.

Tiger populations are seriously threatened with extinction when their numbers, which naturally fluctuate, drop too fast. When this happens the population can no longer stabilize itself, and loss of genetic diversity compromises the health and sustainability of the species. Advances in technology have made possible large-scale changes to tiger’s forested homes, and advances in weapon technologies have made tiger hunting easier and

¹⁰ Valmik Thapar, *Tiger: The Ultimate Guide*, 1993.

¹¹ David Quammen, *Monster of God: The Man-Eating Predator in the Jungles of History and the Mind*, New York: W.W. Norton & Company, 14, 2003.

safer for the hunter. Habitat fragmentation that literally broke the tiger species apart, creating subspecies on separate islands, continues to weaken the genetic diversity of the species. Despite laws, bans, and restrictions, humans still freely enter the forests and poach great numbers of tigers, and lack of sufficient prey often forces tigers into areas inhabited by humans.

Three subspecies have already been lost due to some combination of the aforementioned threats. Within the past 70-years, the Java, Bali, and Caspian tiger subspecies have all vanished in the wild. These rapid extinctions prompted several eminent officials, including Peter Jackson of the Species Survival Commission, to predict the elimination of all populations in the wild by the year 2000.¹² Although this prediction has not yet become a reality, it is entirely possible within the foreseeable future.

Repercussions from habitat loss and fragmentation, combined with poaching and decreases in prey populations, make up the three primary factors that seriously threaten the survival of the five remaining subspecies today.¹³ Current consensus postulates that the remaining five subspecies face imminent extinction in the wild if habitat loss and poaching continue to drive their numbers down. The next section will identify what are now widely known as the three primary conditions that threaten the tiger's future survival.

Potential reversal of the extinction of the tiger species will require us to extend our focus beyond that of our immediate lives, jobs, and communities. As Biologist Paul R. Erlich stated, the tiger crisis calls for a worldview that appreciates animals for more than

¹² Peter Matthiessen, *Tigers in the Snow*. New York: North Point Press, 2000; Seidensticker *et al*, *Riding the Tiger*, 1999; Peter Jackson, *Endangered Species: Tigers*, London: New Burlington Books, 1991.

¹³ S. Biswas and K. Sankar, "Prey Abundance and Food Habit of Tigers (*Panthera tigris tigris*) in Pench National Park, Madhya Pradesh, India," *Journal of the Zoological Society of London* 256 (411-420), 2002.

“what they might or might not do for *Homo sapiens*.”¹⁴ Biologist David Ehrenfeld’s *The Arrogance of Humanism* (1978) touched on this issue implicitly. The ecological value of the tiger to its niche is further explored in chapter two.

Tiger subspecies from Bali (*P. t. balica*), Caspian (*Panthera tigris virgata*), and Java (*P. t. sondaica*) vanished within the latter-half of the twenty-first century. Official reports confirmed extinct status for these three in the 1940s, 1970s, and 1980s, respectively. The loss of the Bali and Javan groupings left Indonesia with just one tiger subspecies - in Sumatra (*Panthera tigris sumatrae*)¹⁵ Tiger populations today are dispersed across eighteen countries from Sumatra to Russia, and their numbers are decreasing steadily. Amur (Siberian), Bengal, Indochinese, South Chinese, and Sumatran tiger populations occupy five general regions across Asia.¹⁶ They live within areas that scientists identify as “metapopulations.”¹⁷ The possibility of extinction is higher within these patches of habitat than it would be without extreme land division. The Amur (Siberian) tiger primarily occupies an area in southeastern Russia, although a few are believed to exist in northeastern China and North Korea. Recent surveys place their numbers at around 400 in the wild and 500 in captivity. They are the largest of the subspecies, with brown stripes and coats comparatively lighter than the others. They prey

¹⁴ Paul R. Erlich, “Extinctions and Ecosystem Functions: Implications for Humankind,” in *Animal Extinctions*, published by the Smithsonian Institution in 1985.

¹⁵ Timothy G. O’Brien, Margaret F. Kinnaird, and Hariyo T. Wibisono, “Crouching Tigers, Hidden Prey: Sumatran Tiger and Prey Populations in a Tropical Forest Landscape,” *Animal Conservation* 6 (131-139), 2003.

¹⁶ Matthiessen, *Tigers in the Snow*. New York: North Point Press, 2000.

¹⁷ A metapopulation is, literally, a population of populations. Seidensticker *et al*, *Riding the Tiger*, 1999.

on elk and wild boar and tend to occupy ranges from 150 miles (female) to 400 miles (males).

Most South China tigers live in South China, although a few may exist in central and eastern China as well. This subspecies is currently the most endangered, with an estimated 10-30 wild tigers and 47 in captivity. They are smaller in size than most of the other subspecies and have wider stripes. Tigers are heavily poached in this area to meet local and international demand. Their bones are ground up for use in medicine. Poaching is a threat of particular seriousness to this subspecies. China is the world's largest exporter of manufactured tiger bone derivatives, the sale of which is a great boost to the economy. The higher standard of living for many has only increased this demand.

Renewed interest in the more traditional Chinese cures are attractive to a growing group of consumers seeking alternatives to Western medicine. The use of tiger-derived medicines also symbolizes for many wealth and power. The strong demand for an ancient and traditional way of healing driving the market today poses the greatest threat to conservation efforts in the country and is in fact exceeding the demand. According to the Environmental Investigation Agency (EIA), an average of one tiger is killed a day to support the international tiger-part trade.¹⁸ Declining tiger numbers have not inhibited the demand, but they have inflated the price considerably.

The Bengal tiger occupies ranges in India (about 80%), Nepal, Bangladesh, Bhutan, China, and Myanmar. They are one of the more plentiful of the remaining subspecies, with approximately 4,700 believed to be living wild and about 210 in captivity around the world. They are one of the larger subspecies and prey on wild deer and cattle.

¹⁸ Debbie Banks and Julian Newman, "The Tiger Skin Trail," *Environmental Investigation Agency*, London, UK, 2004

Their range sizes are relatively small – up to 40 square miles for males and 15 miles for females.

The Sumatran tiger occupies a range on the Indonesian island of Sumatra. There are only about 400 wild and 210 that are captive worldwide. Their coat is the darkest of all of the subspecies, and the stripes appear close together. They are the smallest of all the subspecies, with males weighing up to 260 lbs, and females up to 200 lbs.

The Indochinese tiger occupies ranges across most of Southeast Asia, Thailand, Myanmar, southern China, Cambodia, Laos, Vietnam, and peninsular Malaysia. There may be as many as 1,785 in the wild, and there are 60 in captivity in Asia and the U.S. They live in rocky, mountainous terrain, so studying them has been difficult. The males weigh up at 400 lbs; the females weigh as much as 250 lbs. They prey on wild pig, wild deer, and wild cattle.

Population figures quoted above were compiled from a variety of census estimates within that past five years.¹⁹ The numbers appear here as an average of figures that were quoted the most frequently. Comparatively, the Bengal tiger is the most plentiful, followed by the Indochinese, then the Amur (Siberian) and Sumatran. South China's tiger comes in last and is, by all accounts, dangerously close to becoming the first tiger extinction of the twenty-first century.

Studying the tiger: assessing the damage

The tiger is as elusive as it wants to be. They are experts at what they do best: wait, watch, stalk, and pounce. Virtually all five existing subspecies struggle to sustain their numbers

¹⁹ Banks and Newman, "The Tiger Skin Trail," 2004; Hemley, International, 1994; Jackson, "Numbers," 1999; See also www.5tigers.org.

from under the tremendous weight of major causes explained above. It is difficult for us to know how many tigers in the wild exist at any given time. Exact figures of tigers in the wild vary. It is only possible to report the most recent published estimates and warn the reader to bear in mind that they are at best an educated guess.

The assumption that figures published yesterday, or today, will undoubtedly be lower tomorrow is the trend that conservationists are working hard to reverse. Many figures are based a combination of population studies and head counts of tigers killed by hunters or confiscated from poachers. Comparing patterns based on population estimates over time has proved useful for gaining insight into which combinations of conditions seem to accelerate population declines.

Gaining accountability for tigers through a head count of victims of poachers drives a sobering point home for many of us. The obvious trouble with published estimates is that they tend to be quoted often – and taken as fact. Although approximate, however, comparing populations at intervals can offer us an idea of the speed at which we have decimated their populations. In the 1940's, Jim Corbett estimated that 2,000 tigers remained in the wilds of India.²⁰ In 1964 E.P. Gee placed that number more than slightly higher at 4,000. He also guessed that fifty years prior there had possibly been 40,000 in India.²¹ Indian naturalist Jim Corbett, and many others invested in alterations in tiger numbers, have long considered the situation in India critical enough to require protection

²⁰ George Schaller, *The Deer and the Tiger: A Study of Wildlife*. Chicago: University of Chicago, 227, 1967; see also Stracey, "The Future of the Tiger," *The Cheetal* 3:2 (29-32), 1961.

²¹ E.P. Gee, *The Wildlife of India*, 1964.

management from the government and the cooperation of local people.²² This difficult task is discussed in chapter six.

Late in the twentieth century, J.C. Daniel, who was associated with the Bombay Natural History Society, teamed with forester Kailash Sankhala to compile population estimates from official reports around the country. Their tally amounted to 2,500 wild tigers in India. This alarming figure prompted the first official tiger census, which was conducted by Sankhala in 1972. This census reported a tiger population of approximately 1,827 in India, although his disclaimer noted that they had “positive information about the presence of only about 1,800 tigers in India.”²³ This figure showed a rather large drop from 4000 counted in 1947.

This census was the first official study to trace pugmarks, or paw tracks in the earth, as a means for counting tigers in a given area. Unfortunately, there were difficulties in surveying all of the areas, and many pugmarks were probably counted twice.²⁴ The grand total published in India in 1989 was 4,334.²⁵ These numbers lowered through the 1990s. In 1998, *The Cat Specialist Group* estimated that there were between 2,500 and 3,750 Bengal tigers in India.²⁶ The 1999 Millennium Tiger Conference in Delhi estimated that 3,810 Bengal tigers existed.²⁷ Comparing numbers that drop by increments is useful for determining certain decline. Even armed with this knowledge, it is still shocking to

²² Schaller, *The Deer and the Tiger*, 1967.

²³ Jackson, “Editorial: The Numbers Game,” 1999.

²⁴ *Ibid.*

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ Matthiessen, *Tigers in the Snow*, 2000.

hear the grand total of 5,000 to 7,000 for all subspecies compared with 100,000 tigers at the turn of the twentieth-century.

It is essential that the most accurate estimates of tiger populations are obtained if they are to aid conservation efforts. Understanding the population dynamics of a species in decline is known to be central to implementing appropriate recovery practices.”²⁸ This is particularly true for the tiger, considering its rapidly declining populations since the nineteenth century. Unfortunately, factual population statuses are often difficult to obtain. Estimates that exaggerate or downplay data exacerbate this problem. Because of the difficulty in acquiring observations of the normally secretive tiger species, resulting figures are approximate at best.

Wildlife managers began tracking tiger pugmarks in the nineteenth-century, and for three decades we have relied on this method. Within the same period, the forest department collected census data in India’s Kahna National Park by counting tiger pugmarks around water holes. Karanth describes searching for the traces of prey carcasses, or the scat the tiger’s had left behind. Of the two, he found the latter to offer the more accurate picture of what the tiger ate. Kailash Sankhala was among the eminent Indian naturalists who recognized that conservation of India’s tiger required that a large-scale and dedicated effort be made to conserve its local habitat. In a manner similar to that of Jim Corbett, Sankhala switched careers in favor of his dedication to wildlife conservation. Unlike Corbett, Sankhala shot a tiger only once while employed as a forest ranger in India. This action was certainly acceptable, and even expected, for a man in this position. However, he suffered such guilt from the experience that he devoted the rest of his life to

²⁸ Karanth, *The Way of the Tiger*, 2001.

working on their behalf. Sankhala claimed that the tiger's eyes haunted him, relentlessly asking why he had extinguished its life in such a manner.

Sankhala conducted his well-known tiger census late in the twentieth-century in India. This led him to establish *Project Tiger*,²⁹ which followed the ban on tiger hunting in India in 1972.³⁰ Kailash Sankhala's account of tiger ecology represented growing interest in approaching studies of the tiger in the wild in the interest of finding ways to help them. The report of his field study is integrated with geographical information, prey description, and aspects of the local human culture. He makes a strong case for the strength historical integration of the tiger within Indian history and culture.

It is impossible to study the tiger in isolation – or for that matter any wild animal – without distorting the picture. The tiger is part of the land of India, intimately connected with his terrain and his neighbors, and therefore they too must come into the story...³¹

Then Indian Prime Minister Indira Gandhi recognized that the project was necessary and lent her full support to the project. She commissioned a special task force to tackle the job. In her words: “The tiger cannot be preserved in isolation. It is at the apex of a large and complex biotope. Its habitat, threatened with human intrusion, commercial forestry, and cattle grazing, must first be made inviolate.”³² The projects' overarching mission was to facilitate the protection of interdependent natural systems. An area of

²⁹ Sankhala, *Tiger*, 1977; Matthiessen, *Tigers in the Snow*, 79, 2000.

³⁰ Jim Corbett, Valmik Thapar, Billy Arjan Singh, Ward and Ward, *Tigers and Tiger-Wallah*, 2002; Matthiessen, *Tigers in the Snow*, 2000. This ban also affected the live animal trade and the use and creation of tiger products.

³¹ Kailash Sankhala, *Return of the Tiger*. New Delhi: Lustre Press, 9, 1978.

³² Mullan and Marvin, *Zoo Culture*, 1987.

15,600 square miles in India was set aside to protect the local tiger habitat. These were sectioned off into nine reserves initially; it soon increased to fifteen. The government tried to ward off problems with the local human communities through compensation for cattle killed.

Sankhala's methodology consisted of collecting pugmark tracings to determine an approximate population count. Some public officials were not convinced of the reliability of the approach, although they were not able to propose a better method.³³ The message came through loud and clear to the public. The announcement that there were only 2,000 tigers left in India created a sense of alarm throughout the public. A recent study evaluated the pugmark census method for its efficacy at refining scientific knowledge. The study stated that the method was unable to estimate absolute abundance, finding that it did not adequately address the need for distribution mapping, nor did it produce data showing relative abundance. Alternative paradigms were suggested to correspond more accurately and directly with different terms of tiger monitoring for assessment calling for high refinement. It is often difficult to assess data when it is available, and it is important to understand that an area seemingly devoid of tiger signs does not necessarily mean that there aren't any in the vicinity.³⁴

George Schaller's ground breaking study of the Bengal tiger was published during this period of growing interest in the tiger's problems. *The Deer and the Tiger* is Schaller's rendering of his experiences conducting the first empirical field study of tiger ecology and

³³ Kailash Sankhala, *Tiger! The Story of the Indian Tiger*. New York: Simon and Schuster, 1977.

³⁴ K. Ullas Karanth and James D. Nichols, *Monitoring Tigers and their Prey: A Manual for Researchers, Managers, and Conservationists in Tropical Asia*, India: Centre for Wildlife Studies, 2002.

behavior.³⁵ The study took place in Kahna National Park and tracked the Bengal tiger and four species of its mammalian prey. Beginning with the efforts of Schaller, we begin to see the literal decimation during this period inspire international efforts with institutional backing, public boycotts of tiger products, bans and legislature on tiger hunting and tiger part trading, and dedicated work by groups such as CITES.

An increasing number of studies have been done within the last century on the tiger in its habitat, and tiger-tracking methods continue to improve with time. Population growths and declines are currently tracked with the use of radio-collared telemetry.³⁶ This procedure involves relatively minimal stress for the tiger. The tiger is darted with a tranquilizer. When it falls unconscious, the radio-collar is assembled. Soon, the tiger gains consciousness and continues on its way, only now its moves can be tracked by researchers. This method of tracking the tiger's every movement has advanced tiger ecology considerably.

Modern innovations have allowed for progress in reliable detection technology. For example, the blending of early and modern technologies has made it easier to approach and tag wild tigers with sensitive monitoring devices.³⁷ Capture-recapture camera trapping collects images of tigers at intervals. Because every coat pattern is unique, a history of each tiger can be built over time. Computer models analyze the frequency of each snapshot. This allows for a fairly dependable system of ascertaining population estimates.³⁸

³⁵ Schaller, *The Deer and the Tiger*, 1967.

³⁶ Radio-collaring devices.

³⁷ Seidensticker *et al*, *Riding the Tiger*, 1999.

³⁸ Karanth, *The Way of the Tiger*, 2001.

The “Nepal-Smithsonian Tiger Ecology Project” was instigated in 1973 by John Seidensticker (Curator of animals at Smithsonian National Zoological Park) and Kirti Tamang. The project, based in the Royal Chitwan National Park, was the first of just a few ecological studies to finish out the century. When Peter Matthiessen, Howard and Kathy Quigley, and Dale Miguelle traveled to eastern Russia in 1992 for field research on the Siberian tiger, they made their observations of the tiger’s habits using radio-telemetry.³⁹ Their study’s primary objective was to make recommendations to the local government as to what measures would help save the tiger.

The Siberian Tiger Project was formed in 1992 through the Hornocker Institute (HWI). Maurice Hornocker and Howard Quigley of HWI joined more than a dozen Russian biologists in creating an approach to the field study that combined traditional and modern field methods. These methods have enhanced our understanding of the tiger’s habits greatly. The grim reality, however, is that recent failure to turn up signs of tigers is no longer the fault of our technique at studying them – but evidence of our failure to save them.

Recent population surveys within protected plots of land in India have shown increasing signs of stress, and less evidence of living tigers. Numbers begin to drop almost as soon as the latest estimates are published. Very recent surveys in a wildlife reserve in India’s western state of Rajasthan failed to locate *any* visible signs of recent activity from the twenty-five individuals counted there in 2004. In May, that number had shrunk to

³⁹ Seidensticker *et al.*, *Tigers in the Snow*, xiii, 1992; See also WCS, “Saving the Tiger,” 1995; Radio-telemetry is considered by most to be an improvement over older methods of tracking tigers that relied on pugmark sightings.

fifteen.⁴⁰ The Indo-Asian News Service announced a virtual state of emergency in March 2005 for Ranthambhore National Park following reports of zero tiger activity within the sanctuary for eight-months. Officials mobilized all forest officials and sealed the park while they search for signs of any tiger predation. Poachers are believed to be responsible for this suspected absence of tigers.

Another reserve, Sariska, also seems to be missing its tigers. 1991 census located evidence of 18 tigers in the reserve. That number rose in increments over the next 6 years. By 1997 there were 24. This total lack of tiger signs in the reserve is extremely troubling news for the country. The problem is clear and has been addressed in a number of ways. The unique and magnificent tiger is rapidly losing its grip on life. It was a mere two hundred years ago that wild ranging tigers were plentiful across all of their domains. Now, conservationists must dedicate every resource in order to reverse the debilitating effects of several centuries of human expansion and domination. For many, carnivore conservation is easier to understand intellectually than emotionally. Current conservation strategies are dependent on management strategies that understand the multi-faceted aspects of the problem and seek solutions that consider the problem from multiple perspectives. There is quite literally no time to lose. At this point, each tiger that is poached, poisoned, or starves delivers one more crippling blow to the species. If the conditions exerting pressures on the tiger do not ease up, the tiger of the wild will be lost.

⁴⁰ "Tigers of Rajasthan 'Disappear'", "Emergency in Ranthambhore After Tigers Go Missing," BBC News, 2005.

Murderous amorousness leading to two hundred years of decimation

Tension and conflict define the human-carnivore⁴¹ relationship. This manifold destiny is evident throughout our shared history. In countless ways, humans have modified, or domesticated, the wild natures of animals. These changes influence behavioral tendencies and alter human-animal relations significantly. Once humans have enforced behavioral change, some animals are accepted into human society and some are put to work. Unlike companion animals, or pets, which are generally willing to “make the leap to the biosociality of service,” we do not easily nor naturally bond with predators living in the wild.⁴² Thus, our treatment of them (and their treatment of us) is opposite of the extravagancies lavished on our companion animals. In other words, “one does not eat one’s companion animals (nor get eaten by them), and one has a hard time shaking colonialist, ethnocentric, ahistorical attitudes towards those who do (eat or get eaten).”⁴³

It was aggression, mixed with enough fear to keep our senses sharp that delineated the first human-tiger contact. Once early settlers had progressively tamed the inhospitable Asian landscape enough to begin their forays into the jungle, the tiger was treated as a formidable conquest. Conquering the tiger was considered a true act of bravado. Tiger hunting grew to become an exciting, dangerous sport. Humans increasingly attempted to outsmart the wily cunning of the tiger. The large predator was soon viewed by many people as the formidable and quick-witted beastly antithesis to man.

⁴¹ Two articles that discuss the history of human-carnivore relations are: Adrian Treves and L. Naughton-Treves, “Risk and Opportunity for Humans Coexisting with Large Carnivores,” *Journal of Human Evolution* 36 (275-282), 1999; and Blaire Van Valkenburgh, “Major Patterns in the History of Carnivorous Mammals,” *Annu. Rev. Earth. Planet. Sci.* 27 (463-493), 1999.

⁴² Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness*, Chicago: Prickly Paradigm Press, 14, 2003.

⁴³ *Ibid.*

The forest-dwelling wild tiger was the logical focus for the nineteenth-century explorer⁴⁴, many of whom lived according to a grandiose belief system that stressed: conquer lest ye be conquered. “Murderous amorousness” is a term that aptly describes the treatment of wild tigers by British Colonialists and Indian locals during the nineteenth-century.⁴⁵ This term effectively summarizes a tendency to destroy something that one admires or reveres.

Massive depletions of forests across Asia have effectively blurred physical and psychological boundaries between jungle and civilization. Significant thinning of jungle density has slowly but surely diminished the tiger’s innate fear of man. Human and tiger co-existence has always been characterizes as an ongoing struggle for dominance of the forests as well as a manifest clash of spirits. Some claim that the tiger’s near-demise can be blamed on our altering much of the wildness that used to exist in abundance on the Earth -- and, concurrently, within ourselves. A comparison of the two highlights very real instinctual drives and territorial tendencies.

Humans and tigers are highly successful predators with vastly different motivations, method, and delivery. If a marauding tiger kills a human in a village, it is tragic, particularly for those who love the victim. However, to launch a vengeful and all-out tiger hunt is to handle the situation on an unreasonably shallow level. Tigers hunt because they are hungry or threatened in some way; it is really no more complicated than that. When desperate, tigers are not terribly choosy about what animal constitutes a meal. Fundamentally, humans are not so different at our baser level. Modes of survival force behaviors in both humans and tigers that follow a different set of rules than those enforced

⁴⁴ Geoffrey C. Ward & Diane Raines Ward, *Tiger Wallahs: Saving the Greatest of the Great Cats*, Oxford: Oxford University, 2000.

⁴⁵ Matt Cartmill, *A View to a Death in the Morning: Hunting and Nature Through History*, Boston: Harvard University Press, 1993, 238.

by the governing laws and carefully maintained order of human societies. David Quammen, in his writings on the human-predator relationship, touches on but does not explicitly dwell on human predatory habits. David Quammen defines the “alpha” predator group, of which the tiger is a member, as one “that transcends zoological boundaries to encompass some mammals, some fish, and some reptiles.”⁴⁶ As humans and predators co-evolved, they influenced one another’s development.

David Quammen investigated a messy tangle defined loosely as the human-alpha predator relationship, one that we have tried to represent through cultural iconography. It has had myriad psychological, emotional, mystical, mythical, and spiritual influences on us since its earliest beginnings eons ago. The ways in which we express our feelings and connections to alpha predators speaks volumes for the influence they have had on our worldview. Quammen states that our relationship with alpha predators has had a large role in how we understand our place in nature. He clearly acknowledges that we have transformed the lives of alpha predators through various methods of containment and control. This is one type of management that serves our purposes, but has proven to be immensely damaging to the tiger and its ecosystem.

Several years ago, seminal tiger conservation expert Valmik Thapar expressed his concern over wildlife “mauled to the brink of extinction in India.”⁴⁷ His use of the word “maul” is interesting because it is commonly used to describe an act of aggression exacted on *humans* by *tigers*. The statement suggests that human/tiger positioning could be considered analogous. It is not difficult to conceive of the tiger as victim of the destruction

⁴⁶ Quammen, *The Man-Eating Predator*, 5, 2003.

⁴⁷ Valmik Thapar et al, *Battling for Survival: India’s Wilderness Over Two Centuries*. Oxford: Oxford University Press, 228, 2003.

of its forest home in much the same way as the human who is “mauled” by the tiger is the victim of an act of basic predation. A full-grown tiger needs the equivalent of a full grown ungulate (roughly 70 lbs of raw meat) every day to maintain its optimum health. Tigers in the wild eat, on average, every three to four days, under optimum conditions. When their resources are under pressure, they must expand their options in order to survive.⁴⁸

Exaggerated emphasis on the offensiveness of tiger behavior without evaluating human actions by similar criteria is tantamount to saying that only the human is justified in controlling tiger. Forces that guide naturally defensive behavior are thus converted from the means for survival to something resembling criminal activity, in our minds. Under these pretexts, an unexpected tiger attack, or even the perceived threat of attack, is widely understood to be detrimental to the rights of humanity. When hungry and desperate, humans frequently revert to acts of non-customary desperation as well.

It is probably unnecessary to speak to the inequalities between humans and other species in this forum. However, our reactions to tiger attacks demonstrate a paradox that has led, in part, to the tiger’s dramatic decline. The point is that judging animals by our own standards is dangerous. Understanding tigers on their own terms could allow us to avert many tragic losses, both human and tiger, while supporting the way of life of an important species.

Humans hunt, too. The act of hunting and capturing animals is in fact highly symbolic of human self-perception. The “spectacle” of the hunt is based largely on self-

⁴⁸ Reginald I. Pocock, “Tigers,” *Journal of the Bombay Natural History Society* 33:3 (505-542), 1929; Vivek R. Sinha, *The Vanishing Tiger: Wild Tigers, Co-predators, and Prey Species*, London: Salamander Books, 2003; Karanth, *The Way of the Tiger*, 2001.

definition in relation to the “other”⁴⁹ or non-human species. Anthropological science writer Matt Cartmill⁵⁰ supports this view. His book renounces the hunting hypothesis. He portrays the human hunter as balancing vicariously on the border between wilderness and civilization. Notions of where the dividing line exists continue to evolve over time. Dominant views can also greatly influence conceptions of the hunter within a given culture.

Unlike situations in which animals deemed problematic to humans in some respect can be classified as pests and driven out of an area or exterminated, tigers are now protected by law. This does not guarantee their safety, of course. Support for the cause is growing, however. International organizations are working diligently to raise awareness of the tiger’s plight. The remaining five tiger subspecies are now near the top of the US Fish and Wildlife Endangered Species List. This growing tendency to conserve is tempered with the hampering of conservation efforts by those with motivation or reason to break to the law. Both avenues will be explored in more depth later in the chapter.

This present-day reality has culminated out of a past filled with transgression. All of this should lead us to logically conclude that human response to conflict must involve evaluation techniques aimed at collecting information. The information must encompass the needs, wants, interests, and rights of all involved. The gravity of responsibility falls on humans, naturally. It is up to us to utilize our reasoning and communicative abilities to thoughtfully examine multi-faceted issues, aim to minimize conflict, and endeavor to build conservation structures strong enough to last yet flexible enough to meld with the inevitable changes along the way.

⁴⁹ Ashton Nichols, “Romantic Rhinos and Victorian Vipers: The Zoo as Nineteenth-Century Spectacle,” 11, 1999.

⁵⁰ Cartmill, *A View to a Death in the Morning*, 1993.

Human response formed during the aftermath of human-tiger conflicts vary widely in intensity. One end encompasses our accepting certain events passively, and understanding them to be part of nature. On the opposite end, we sometimes retaliate violently. Humans with sympathies to match the latter view tend to perceive the occurrence with an outlook that is quite the opposite of the more passive reaction. A slew of studies have materialized in recent times that use a methodological approach to gather circumstantial evidence to try to better understand tiger attack. Scientists' Philip Nyhus and Ronald Tilson's survey of tiger attacks in Sumatra uncovered twenty-eight cases in which locals dealt with alleged problem tigers.⁵¹

Many of these were extremists; they dealt with the tiger violently and according to their own terms of justice. It was only a very small percentage who enlisted the help of officials such as police, conservation authorities, military, and the local *pawing harimau* (traditional snake charmers). The latter cases generally resulted in the live capture of the offending tiger. The vast majority of the tigers, however, ended up dead at the hands of indignant citizens. The tigers were either shot or poisoned.⁵² Tiger bodies still turn a lucrative profit in the tiger trade, and many of the tiger's in this case ended up poached for profit.

Our assessments of human-tiger conflict differ in methodological approach from country to country. While the particulars of a tiger attack may vary from case to case, the collection of basic information at the scene can be valuable across the board. For example, evaluating demographics and circumstantial evidence pertinent to the attack may help us to

⁵¹ Philip J. Nyhus and Ronald Tilson, "Characterizing Human-Tiger Conflict in Sumatra, Indonesia: Implications for Conservation," *Oryx* 38:1 (68-74), 70, 2004.

⁵² Nyhus and Tilson reported 265 tiger killings they believe were done out of retribution because of a tiger attack. See Nyhus and Tilson, "Characterizing Human-Tiger Conflict," 2004.

understand true causal influences. These will likely differ in style, but not so much in content. Pertinent details include location and time of altercation and personal attributes of the victim. The studies can often make good use of information such as the victims' actions, anything in their possession that might have elicited the tiger to attack, and any remembered elements of their immediate physical environment.

An investigation of the larger area allows us to document and evaluate environmental disturbances that may have perpetuated the attack. A thorough report takes note of the proximity of the attack to forested land and whether its status is protected or not-protected. Nyhus and Tilson's study assigned location information gathered for the 66 case studies in their report into four main categories. These groupings allowed them to demarcate village attacks from those occurring in agricultural areas, near the forests' edge, and within mostly forested environments.⁵³

Careful evaluation of each conflict, attention to emerging patterns, and understanding of causal factors may help to determine what management approach will help avoid human-tiger conflict in the future. Nyhus and Tilson's study of the tiger attacks in Indonesia also investigated the issue of human-tiger conflict itself. Such matters had been largely unexplored in Indonesia at that time.⁵⁴ Governmental authorities did not maintain systematic records, and consequently there existed only a scattering of information on reported conflicts. Nyhus and Tilson painstakingly combed through governmental, nongovernmental, and media reports and journals. They found that between

⁵³ Nyhus and Tilson, "Characterizing Human-Tiger Conflict," 2004.

⁵⁴ Sponsored by the Save the Tiger Fund, National Fish and Wildlife Foundation in partnership with ExxonMobil and administered through the Minnesota Zoo Foundation.

1978 and 1997, reports showed 146 human casualties, 30 injured in tiger attack and 870 livestock reported killed by tigers.

Not surprisingly, conflict and attack in Sumatra occurred with considerably greater frequency in or near multiple-use forests where people and tigers co-exist. There were comparatively fewer attacks in and near forests designated for the demarcation and protection of tigers. This study highlighted the need for better understanding of the reasons for human-tiger conflict pertinent to Indonesia, emphasizing that they vary from country to country. It is clear that while the situation for each must be examined separately to determine appropriate conservation plans, many common factors tend to exist and it remains important to assess the cumulative situation as well.⁵⁵

One thing that surveys and assessments cannot easily evaluate nor express is the sense of fear and apprehension that often occurs within areas of recurring conflict between humans and tigers. In *Monsters of God*, science writer David Quammen recently appealed to the feeling of fear that predators instill in most humans. He asked his readers to envision two scenarios. In one, predators and humans co-exist. In the other, predators no longer exist on earth. Although the first is the reality we should be able to identify best with, the latter does not really force us to stretch our imaginations. We have already plucked most large predators from their natural habitats.

In cultures where humans and tigers continue to co-exist, life for both can be an inevitable and ongoing zone of conflict. Humans are bound to suffer or die a physical death from their altercations with alpha predators. While we may have equipped ourselves with superior mechanical weaponry, the tiger's physical advantage lies in instinctive killing strength, speed, and built-in natural defenses. Quammen points out that victims of predator

⁵⁵ Nyhus and Tilson, "Characterizing Human-Tiger Conflict," 2004.

attack are usually poor and powerless to change their circumstances. He identifies a social rift that divides those who live and die by predation with those whose wealth and security allows them respite from predation.

Although obviously sympathetic to the vulnerable state of the large predator species, Quammen argues for solutions that encompass the needs of both humans and animals. Some of his solutions might seem at first glance to undermine the very ideals the majority of his readers might uphold. His bold approach is unique in that it forces us to acknowledge that solutions are not always clear-cut. Human-predator conflicts demand that we take swift action or settle on a compromise. Quammen argues that if it is our wish to preserve alpha predators, it may require a greater sacrifice than most conservationists are willing to make. He suggests restricted managing and marketing of a controlled number of tigers for interested parties to hunt and skin. This method would surely be controversial, and would require the sacrifice of a few for the larger goal of conserving the species.

Tigers do not seem the ideal candidate for an approach such as this, however. Several of the existing subspecies harbor numbers so low that every tiger killed threatens the species survival by increments. Let us now address an essential question: how did things get so terribly grim for such a hardy, opportunistic, and resilient predator? There is not one causal influence, but many. Tigers suffer from the degradation of their habitat and from the slaughter of their numbers. Because of our ability to manipulate their natural areas and processes, the actions of humans increasingly threaten all subspecies of tiger across their natural habitats. Although background extinction is a natural process in the

biosphere0, our actions have greatly accelerated this otherwise natural process.⁵⁶ Evidence of human transgressions is obvious throughout all wild tiger habitats.

Declines in wild tiger populations were first noted during the nineteenth-century and greatly accelerated during the twentieth-century. At the start of the present century, all tiger populations exist at levels considered dangerously low for species survival. Most sources blame these declines on several overlapping and overarching causes: massive forest depletion, recreational hunting, poaching, systematic eradication, commercialism, and growths in human populations.⁵⁷ The plight of each tiger subspecies is the result of several or all of these causal factors. The causes and effects of tiger endangerment are the focus of much popular and scholarly attention during the last half-century.

Much of the literature discusses species extinction as the consequence of human population expansion, agriculture, and industrial activity. Humans are typically presented in a similar light to the one I am using right now – as victimizers with little foresight or ecological awareness. This self-deprecating stance may arise from a recent eagerness to make ourselves accountable, at least in literary form, for the damage we cannot hide from any longer.

Although public and governmental support for the tiger has never been stronger, the battle is far from won. Tigers have been chased and pushed to the forests' edges, wounded by bullets, trapped, and poisoned for a long time, and though to a lesser extent, these practices continue to debilitate the species. It is true that less are killed now than in

⁵⁶ Bob Mullan & Garry Marvin, *Zoo Culture*, London: Weidenfeld & Nicolson, 1987.

⁵⁷ David Alderton, *Wild Cats of the World*. London: Blandford, 1998; K. Ullas Karanth, *The Way of the Tiger: Natural History and Conservation of the Endangered Big Cat*. Hong Kong: Voyageur Press, 2001; John Seidensticker, Sarah Christie, and Peter Jackson, Eds. *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge: Cambridge University Press, 1999; Thapar, *Land of the Tiger*, 1997.

the previous two centuries. But it is also true that fewer tigers exist in the wild than ever before.

Three rapidly escalating threats

Habitat loss and fragmentation

There is an immediate and direct link between the endangered status of the tiger and habitat fragmentation. Originally, there was just one tiger species. Aside from one-on-one human-tiger confrontations, the erosion of the tiger's habitat was the earliest form of subjugation for the tiger. Two large predators living at the same time are bound to cross paths sooner or later. Even the actions of our evolutionary ancestors affected tiger habitats, and eventually subdivided their habitat. The clearing of Asian forests to make room for growing human civilizations fragmented the tiger's expansive jungle habitat and forced the larger tiger group to divide into regional groupings. Each of these groups adapted to their surroundings and developed physical variances. Each subspecies was literally stranded on a private island and each quickly dominated the forest, and thrived on land that had ample prey, stalking cover, and territorial range.⁵⁸

Late in the twentieth-century, nomenclature classifications of the tiger were based on sub-specific physical variations, and bio-political boundaries of Asian countries. In 1968 Vladimar Mazak designated eight tiger subspecies according to weight, color, stripe pattern, and geographic region.⁵⁹ Previously, tigers were classified similarly in accordance with the system of Carl Linnaeus. Subspecies were additionally demarcated according to

⁵⁸ Andrew C. Kitchener and Andrew J. Dugmore, "Biogeographical Range in the Tiger, *Panthera Tigris*," *Animal Conservation* 3 (113-124), 2000.

⁵⁹ Ronald L. Tilson and Ulysses S. Seal, eds. *Tigers of the World: The Biology, Biopolitics, Management, and Conservation of an Endangered Species*, New Jersey: Noyes, 1987.

phenotypic differences such as skull and bone measurements and body size. Although Andrew Kitchener, curator at the Royal Museum of Scotland, pointed out that this eight subspecies model was created based on the data of only eleven individuals, it has been widely promoted.⁶⁰ This is the most likely reason that it prevails to this day.⁶¹ Genetic advances in the late twentieth-century brought molecular DNA research to the forefront of the sciences, including taxonomy.⁶² This method, which boasts superior precision, divided the tiger species into five groupings based on genetic information.

The first system delineated eight subspecies, and now three of those eight are known to be extinct from the wild. The second, recent, system recognized five genetically variable groups. In this case, only two groupings currently sustain populations in the wild; the other three are extinct. No individuals from the three recently extinct subspecies exist in captivity.⁶³ No matter how the subspecies are divided, the tiger's future does not look promising. Investigating root causes of the tiger's predicament will help to shed light on this aggrieving problem.

Government-sponsored exploration of the eighteenth through twentieth centuries is often blamed on the loss of massive amounts of forested land throughout Asia.⁶⁴ Ecological historian Mahesh Rangarajan stressed responsible managing of land divisions,

⁶⁰ Andrew C. Kitchener and Andrew J. Dugmore, "Biogeographical Range in the Tiger, *Panthera Tigris*," *Animal Conservation* 3 (113-124), 2000; Seidensticker *et al*, *Riding the Tiger*, 1999; Peter Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World 1600-1950*. New Haven: Yale University, 2001.

⁶¹ Karanth, *The Way of the Tiger*, 2001.

⁶² Oliver A. Ryder, Anne McLaren, Sydney Brenner, Ya-Ping Zhang, and Kurt Benirschke, "DNA Banks for Endangered Animal Species," *Science* 288:5464 (275-277), 2000.

⁶³ Karanth, *The Way of the Tiger*, 2001.

⁶⁴ Mahesh Rangarajan, *India's Wildlife History: An Introduction*, Delhi: Permanent Black, 2001.

along with greater understanding of our relations with the natural world, as issues demanding serious and immediate concern.⁶⁵ Collaborations between the World Wildlife Fund (WWF) and the Wildlife Conservation Society (WCS) produced a comprehensive land survey at the end of the twentieth-century.⁶⁶ The survey declared 160 distinct tracts, or Tiger Conservation Units (TCU), within twelve countries, as potential tiger habitat. Habitat loss, fragmentation, and degradation pose serious long-term threat to the wild tigers, and land management is a serious concern for conservationists. We will now explore poaching, the single greatest short-term threat to the survival of the wild tiger.

Poaching

Apart from their functional purpose, the tiger's unique and individualized coat patterns have been an important aspect of their mystique and a large aspect of their economic value to humans. Tiger poaching occurs everywhere that there are tigers. Many poachers prefer the inexpensive method of poison over killing the tiger with a weapon. A single tiger skin can make the trader as much as US\$5,550 richer. Historically, tigers have been ostracized by the Government and by citizens across Asia for posing a consistent and real threat to humans within their geographic range. Tigers have been poached for their body parts for well over 1,000 years. The practice has increased to epidemic proportions and is a huge problem today. Poaching essentially replaced former nineteenth-century trophy hunts as the direct and widespread form of tiger killing.

⁶⁵ Rangarajan, *India's Wildlife*, 2001.

⁶⁶ Wildlife Conservation Society (WCS) Policy Report No. 3, "Saving the Tiger: A Conservation Strategy," 1997.

The tiger body part trade began in northern India in the mid 1980s but really took off in the early 1990s. Although such practices were officially banned by the UN Convention on International Trade in Endangered Species (CITES), a significant number of poachers continue to confiscate tiger bodies for trade on the international black market. Bans are poorly enforced in most places. Fines are not high enough to deter offenders, and arrests rarely result in jail time. Between 1993 and 1994 36 tiger skins and 667 kilos of tiger bones were seized in India.⁶⁷ Some areas of the world now consider it politically incorrect to purchase and treat animal parts as commodities. This is particularly true in the West, although a demand for skins certainly exists there as well.

The coat of the tiger is admired the world over for its beauty and quality. For those struggling to make ends meet, tiger skins can be an incredible asset to boost one's financial situation. Given the history of conflict between humans and tigers, it is not difficult to understand that the value of the tiger's form is higher than the living creature. Humans are, overall, motivated and esteemed through their material possessions. In a very real sense, pelts often receive greater consideration than the spirit of the tiger within. According to an old Malay saying, "The tiger dies but his stripes remain."⁶⁸

The tiger's appearance is distinct and fascinating visually, but evolved to suit the sleek and stealthy skills of the striped hunter. Their prominent black and orange stripes provide natural camouflage, enabling them to slink around largely undetected in the jungle. Stripes blend and contort the lines of the body. Their effect is amplified during peak sunlight hours by the sun-dappled rays coming through the forest canopy.

⁶⁷ Cory J. Meachum, *How the Tiger Lost its Stripes: An Exploration into the Endangerment of a Species*, New York: Harcourt, Brace & Co., 1997.

⁶⁸ Matthiessen, *Tigers in the Snow*, 72, 2000.

It is difficult to convince an economically impoverished individual to elevate the conservation of the tiger over the survival of their family. Illegal poaching has so detrimentally affected tigers that it is approaching habitat loss in terms of long-term damage. Losses incurred from the actions of those who continue to poach wild tigers seriously threaten to cripple conservation efforts.⁶⁹ According to trading law, without demand, supplies would become irrelevant. Illegal international trading of tiger skins has long operated in conjunction with the tiger bone trade. Increases in personal wealth, combined with growing human populations worldwide have only increased the market for their skins. Between 1989 and 1993, India lost an average of 350 tigers a year to poaching activity.⁷⁰ Despite mainstream concern for the tiger's safety, poaching is actually rising.

Cultural and economic pressures make it very hard to protect tigers. Ever since the production of sophisticated firearms and cars, tigers have been fair game to hunters and poachers and villagers have poisoned them for years in defense of their livestock. Tiger body parts have long been used to satisfy those with beliefs tied to their healing properties. Tiger populations have taken staggering losses to profit and medicine. For example, eighty thousand tigers were killed in India between 1875 and 1925.⁷¹

A statement published by the Environmental Investigation Agency in the fall of 2004 reported increases in the numbers of confiscated tiger skins.⁷² In this report, the EIA

⁶⁹ M.D. Madhusudan and K. Ullas Karanth, "Local Hunting and the Conservation of Large Mammals in India," *Ambio* 31:1 (49-54), 2002.

⁷⁰ Seidensticker *et al*, *Riding the Tiger*, 1999; See also G. Hemley, *International Wildlife Trade: A CITES Sourcebook*, Washington D.C.: Island Press, 1994.

⁷¹ Hemley, International, 1994; Debbie Banks and Julian Newman, "The Tiger Skin Trail," Environmental Investigation Agency, London UK, 2004; See their website www.eia-international.org.

⁷² Banks and Newman, "The Tiger Skin Trail," 2004.

revealed clandestine networks of operation linking traders in India with traders in Nepal and China. From there, the market diffuses for sale to any country worldwide. Maps in the report demonstrate common trading routes. The report also includes a table in which they have compiled a list of seizures. Tiger, leopard, and otter skins were seized from India, Nepal, and China, between 1999 and 2004. During these five years 79 tiger skins and more than 400 tiger claws were reportedly seized. These high numbers are an alarming wake-up call to the inefficiencies of law enforcement in these areas. This will be explored further in chapter six.

Asian locals have traditionally used body parts for medicine, “a deadly tribute to the enduring belief in the power of the tiger.”⁷³ Some of these uses have fallen by the wayside but others have survived in folk medicine. Modern practitioners and consumers who partake of tiger-derived medicines today exist more on the fringes rather than the mainstream of the societal belief structure. Though there are fewer practitioners, ancient practices are still used by those who prefer traditional Chinese folk medicines. There are no proven medicinal qualities in the tiger’s body, nor does there need to be any. Trade could still exist if no tigers were poached. The psychological impact of the tiger is potent enough on its own. So-called tiger products have been known to contain no trace of tiger bones or other parts. Ground up tiger parts are extremely difficult to demarcate from products made from other animals. To engage in false advertising would, of course, be unethical and highly tolerated if word got out.

People continue to order and partake in this illegal trade in part because advertising has been so successful at pinpointing recurring health problem in which many people need a cure or fast relief. This approach works in combination with the practice of

⁷³ Seidensticker *et al*, *Riding the Tiger*, 53, 1999.

using nostalgia for ones' cultures history.⁷⁴ Consumers wishing to stay connected with the past through these ancient remedies may try the use of tiger brains for banishing laziness – and pimples. Epileptic patients traditionally receive concoctions containing tiger eyeballs to ease their symptoms. Whiskers from the tiger have long been used to cure toothaches, while the tiger's tail is used to treat a variety of skin conditions. Finally, tiger bones are used to treat symptoms of rheumatoid arthritis, including weakness, stiffness, or paralysis of the lower extremities. The last item on the list is the use most associated with the use of illegally-procured tiger parts in medicine today.⁷⁵

Distinctions between the goals and practices of Asian folk medicine and practitioners of Traditional Chinese Medicine (TCM) are telling of provisional belief and interests. While the former is generally the more controversial of the two, the latter has borne the brunt of attacks from conservationists. In recent years, practitioners of TCM have publicly refuted any assumed connection between the two. Clearly, the debate is not over whether or not TCM includes tiger parts in their medicines. It is more of a disagreement over the particulars of their uses. In this way, a sense of inspired sentiment towards uses of the tiger's body for medicine and profit has characterized at least one strand of our perception of the tiger.⁷⁶

Human reverence for the tiger's strength, endurance, and grace is associated with the traditional belief that the sexual prowess of the tiger can be transferred from tiger to human through ingestion. Despite a lack of empirical support, believe in this power to this day. Throughout the debates over the use of certain tiger parts for their aphrodisiac

⁷⁴ Seidensticker, *et al*, *Riding the Tiger*, 1999.

⁷⁵ Meachum, *How the Tiger Lost Its Stripes*, 1997.

⁷⁶ Hemley, *International*, 1994.

qualities, practitioners of TCM continue to deny that they have ever included this part of the tiger in their products.⁷⁷ This dispute has turned into a point of contention for supporters of TCM. It has also widened the gap of understanding between TCM practitioners and conservationists. TCM's defensive posture over the debate has even exacerbated the myth that tiger parts are never used for medicinal purposes. Controversies aside, alleged aphrodisiacal properties in tiger penis soup and tiger penis wine mean that they remain one of the more compelling tiger-part products for poachers and consumers alike.⁷⁸

Poaching is particularly dangerous to struggling tiger populations because of the amplified effect on the wild population. When one tiger is poached, the effect potentially reverberates as much as tenfold. If a tigress is killed, the cubs she has hidden will starve. If the victim is male, a male from a nearby territory will move in to occupy the niche he has left behind. In order to ensure his dominance, he may kill the cubs of the resident tigress.⁷⁹ In 1998 the Director of *Project Tiger* announced his belief that an average of one tiger a day was poached.⁸⁰ It is imperative for the survival of tiger subspecies that the poaching traders relax their grip on the tiger. Acceptable alternatives should replace traditional tiger body part uses, and compensation should be offered in conjunction with any human-tiger conflict that results in loss of life, livestock, or property.

In addition, law enforcement should dole out punishment for crimes against tigers that are severe enough to act as a deterrent from engaging in the practice. Law

⁷⁷ Hemley, *International*, 1994.

⁷⁸ Andrew Lam, "TCM and Asian Folk Medicine: Myths and Misunderstandings," in "Forever Tigers: Drinking Tiger Soup," *Pacific News Service*, 1996.

⁷⁹ Kailash Sankhala, *Return of the Tiger*, 1978.

⁸⁰ Peter Jackson, "Editorial: The Numbers Game," *Cat News* 30:1, 1999.

enforcement is essential if conservation efforts are to make a fundamental difference. Traditionally, the manner in which humans obey laws imposed on them is proportional to the severity of the punishment if caught. Any infraction against a tiger should be considered and treated as a crime (against the government, conservationists, and everyone who considers tigers worth conserving). The true crime is against the ideals of conservation. It represents a reluctance to expand ethical, ecological, and intellectual boundaries to identify with twenty-first century goals. People who work to conserve the tiger confront the problem armed with knowledge gleaned from two-centuries that are characterized by massive destruction, intensive study, and inspired protection. The third and final threat, decreasing prey populations, relates to tiger survival and behavior and has direct bearing on human-tiger conflict.

Decreasing prey populations

Carnivores, who subsist on only meat, subsist only as well as the prey populations in their habitat permits. Prey density is a key factor in tiger abundance, and it factors strongly into how settled the tiger will be in its territory. A field study conducted at the turn of the century evaluated the food habits of tigers. The study was based on a population living in India's Pench National Park in Madhya Pradesh. The purpose of the investigation was to analyze the tiger's feeding habits in relation to local prey attributes and availability.⁸¹ The researchers performed routine scat analysis to gauge estimates of availability and types of prey, and concurrent effects on the tiger's food choices. The researchers used the line transect method to gauge prey species density. Their final conclusions were in support of

⁸¹ Population attributes of prey species = population structure, density, and biomass.

the fact that tigers prefer medium or large prey, when given a choice, to prey of lesser density. High prey density in the area of their study was adequate to meet the demands of the tiger population, thus reducing the risk that they would prey on domestic livestock. However, when high density prey was insufficient, the tigers ate what was available.⁸²

Lack of sufficient prey, which can force tigers to roam outside of their normal territories looking for food, is one of the primary causes of human-tiger conflict.⁸³ The three threats to the tiger's survival - habitat loss, poaching, and prey population decline - seriously disrupt the wild tiger's territorial, feeding, and social needs. Additionally, all three tend to increase the chances for potentially dangerous interactions with human populations within close proximity. The chapter has thus far outlined a grim situation for the tiger's future survival and explained some major cause and effect relationships that continue to exacerbate in areas of conflict. Now we need to address the worst of outcomes for us and for the tiger – extinction. The next section will address the current status of the remaining numbers of tigers. All of them face extinction in the wild, some sooner than others.

Before delving into the major transition points of the thesis, it is important to layout the background premise. The value – and threat – of the tiger is largely tied up in the way we have perceived it. Investigating this mental process involves an assessment of how humans slowly redefine prevalent conceptualizations concerning the nature of *wild* – within the tigers roaming the forest and within ourselves. Ironically, even as we continue

⁸² The study concluded that, based on these two primary conditions, Pench National Park was a potentially useful area for tiger conservation efforts.

⁸³ K. Ullas Karanth, "Tigers and their Prey: Predicting Carnivore Densities From Prey Abundance," *PNAS* 101:14 (4854-4858), 2004.

to shrink the wild within the forests, we also seek to connect with our lost nature by visiting zoological parks.

An essential question that we must consider is whether there will be enough time to gather our data and materials, advocate to gather the support of the masses, reduce deforestation and poaching pressures enough to give the tiger a fighting chance for recovery. It seems we have come full circle, from slaughtering tigers and their cubs to granting them a second chance to exist in nature, such as it is. The story begins by revealing evolutionary processes that created our past and present perceptions, in an ancient place known as the *wilderness*. Investigating our perceptions of the wilderness that tiger's naturally inhabit can help us to unpack the exact nature of our conflict with the wild tiger.

Changing wilderness ideals, perceptions, and boundaries

Humans evolved into a world of abundant flora and fauna and quickly got busy, colonizing earthly processes on both micro and macro levels. Relatively recently, awareness set in for many of them and they saw that much of the Earth was damaged or significantly altered. Humans contemplated matters in terms of ethical, philosophical, and rational implications. They were able to deal with their sense of displacement from the Earth with carefully constructed justifications. Today, humans linger in the aftermath of two centuries of turmoil and upheaval of the forested tracts in which tigers were once abundant. It is now imperative that we utilize our mighty advances in science and technology to piece together what is left of the habitat of the tiger.⁸⁴

⁸⁴ Sankhala, *Return of the Tiger*, 1978; Seidensticker, *Riding the Tiger*, 1999; Sinha, *Vanishing Tiger*, 2003.

Even the subjectivity of the notion of wilderness has been challenged and its definition slips through our fingertips easily. Wilderness may be in a greater state of alteration than at any other point in history, but since the evolution of humans' most remote ancestors, it has not been without our influence in some form or another. Wilderness is a place that is untouched or modified by humans. In true wilderness, "the land is 'self-willed' – where natural processes, not human agency, direct the ebb and flow of life."⁸⁵ Wilderness as such does not actually exist and never existed uninfluenced by life on earth. Twenty-first century wilderness is an idyllic state (of mind) and is often linked with environmentalism.

Prominent environmental historians commonly describe our attempts to reconnect to the natural world. Environmentalist Ted Steinberg (2002) states that powerful and unforeseen natural forces affect human perception as much as they shape the natural world. Nash (1967) and Cronon (1995) also contributed their ideas to the transformation of intellectual thought regarding the slippery concept of "wilderness." In general, wild areas encompass attributes that humans consider unwieldy.⁸⁶

The developing field of environmental history describes the role of nature in the lives of humans. Stewart and Worster offer similar definitions of the three branches of environmental history, which can be applied to our changing ideas of wilderness. The first is the study of changes in the natural environment over time, or understanding nature outside of human influence. The second looks at the socioeconomic realm, or the ways in which humans have converted the physical environment. The third branch situates

⁸⁵ Tom Butler, Ed. *Wild Earth: Wild Ideas for a World Out of Balance*. Canada: Milkweed, xv, 2002.

⁸⁶ Laura Waterman and Guy Waterman, *Wilderness Ethics: Preserving the Spirit of Wildness*. Vermont: The Countrymen Press, 1993.

environmental issues within an intellectual and theoretical framework. It considers mental, cultural, mythical, and iconic perceptions as *both* causing and affecting our interactions with nature.

Cronon hypothesized that if we can abandon the notion that wilderness is set apart from human existence, we would be free to appreciate its truly integrated aspects in our lives. For example, the strip of grass in the highway median is no less a part of nature than the deepest parts of the rainforest. This view encompasses a conservation ethic that is holistic and sustainable, and has been the subject of debate. Cronon writes that we should not take wilderness too literally, however.⁸⁷ He encourages us to recognize nature, and modifications thereof, as fundamentally a human creation that is not set apart, but rather defined by our conceptual history. Nash focused on how religious and philosophical views shape human thought and belief. He saw them as providing justification for our historical transformation of raw, wilderness elements into materials fit for human use and consumption. Aldo Leopold pondered the value of wild nature to humans when he urged us to consider whether we could, or should, allow all members within a nature community to remain in place.⁸⁸

This study approaches the history of tiger conservation with a blending of the levels of environmentalism and changing perceptions of wilderness. Our perceptions and treatment of the wild tigers has changed over time, efforts to conserve them continue to face socioeconomic pressures, and all of our actions signify theoretical and intellectual progression of ideals. What *was* the nature of the forests – and the wild tiger - before

⁸⁷ William Cronon, “The Trouble with Wilderness or Getting Back to the Wrong Nature,” from *Uncommon Ground: Toward Reinventing Nature*, edited by William Cronon, W.W. Norton & Co., 1995.

⁸⁸ Aldo Leopold, *Sand County Almanac*. New York: Ballantine, 1986.

humans entered the picture? That point, it turns out, is moot. We cannot know how nature operated before our presence permeated the Earth. Our footprint caused an ecological indent almost immediately upon our arrival on this planet. Some animals have always been at odds with humans; the alpha predator is one of these. David Quammen addresses problems that large alpha predators face, such as poaching and habitat destruction resulting from expanding human populations.

Despite centuries of tension and conflict, humans are devoting extreme amounts of time, energy, and sparing no expense to reverse the tiger species' demise. Reverence for their beautiful form and admiration for their wild nature is built into many of our cultures. Multiple paradoxes can be discerned in the human-tiger relationship. Many of these stem from an innate fear and distrust of alpha predators. We often react to threatening forces with forced control. The desire to conserve a species for its own sake rather than ours is a concept well worth unraveling here.

Why we care: Biophilia

Within the twentieth century, humans intensified their efforts to conserve tiger bodies, while citing reasons of ecosystem health and diversity. However, perhaps the greatest motivator for some of us is the tragedy that we feel will befall us if we do not conserve the tiger. A question that is largely tacit remains: why invest effort and resources in something that does not obviously and directly benefit humans? The relatively recent theory, *biophilia*, provides a framework for analysis of many intrinsic qualities and behaviors throughout our history that have prompted us to save species that we do not have a basic one-on-one bond with, such as the alpha predator. Renowned scientist and conservationist

Edward O. Wilson published *Biophilia* in the late twentieth century.⁸⁹ His book encompasses the resiliency of the innate human motivation to conserve that reverberates throughout this study. In his words

Biophilia, if it exists, and I believe it exists, is the innately emotional affiliation of human beings to other living organisms. Innate means hereditary and hence part of ultimate human nature. Biophilia, like other patterns of complex behavior, is likely to be mediated by rules of prepared counterprepared learning – the tendency to learn or to resist learning certain responses as opposed to others. From the scant evidence concerning its nature, biophilia is not a single instinct but a complex of learning rules that can be teased apart and analyzed individually. The feelings molded by the learning rules fall along several emotional spectra: from attraction to aversion, from awe to indifference, from peacefulness to fear-driven anxiety.⁹⁰

Biophilia attempts to explain the innate human response to all living things. Promoters of the theory believe that biophilia explain the genetic, behavioral, cultural, and biological motivations that lead humans to protect rather than destroy other living things. *The Biophilia Hypothesis*, published roughly a decade after Wilson's first groundbreaking book on the topic, is an interdisciplinary venture. Wilson co-edited the book with social ecologist Stephen R. Kellert of Yale.⁹¹ It features inspired debates between biologists, psychologists, philosophers, and anthropologists. The views of each of these disciplines are represented through concentrated analysis of how the theory might serve as a mediator between humans, science, and ethics. Biophilic notions stand in stark contrast to dominant

⁸⁹ Edward O. Wilson's publications include *On Human Nature* and *The Ants* (both of which he won a Pulitzer Prize for), *Naturalist*, *Sociobiology*, and *Consilience*.

⁹⁰ Stephen R. Kellert, and Edward O. Wilson, Eds. *The Biophilia Hypothesis*, Washington D.C.: Island Press, 31, 1993.

⁹¹ Stephen R. Kellert is recognized as the world's foremost authority on human and animal relations. His publications include *The Value of Life* and *Kinship to Mastery*.

paradigms that have, throughout history, viewed animals as commodities to serve human interest. Biophilia is attractive to humans across many disciplines, in part because it helps them to understand their own feelings, actions, and even professional choices.

The emerging conservation ethic between the late nineteenth-century and today conforms nicely to the theoretical framework of biophilia. How can biophilia help us to understand human-tiger relations better? Edward O. Wilson's opening chapter within *Hypothesis* highlights the comparison clearly. The chapter is appropriately entitled, "Biophilia and the Conservation Ethic." Much of the work of biologists and conservationists' today focus on the historical manifestations of human civilizations built over ten thousand years. The biophilia hypothesis links our emotional responses to symbols and artifacts present within our culture. This concept goes hand in hand with the influence that our emotional ties to nature have on the very creation of cultural symbols and artifacts.⁹²

Although speculative, evidence is strong in support of the notion that biophilia manifested through the course of human evolution. Likewise, the evolution of the conservation ethic has progressed along a lengthy timeline. Along the way, points of dissention between the human and tiger coincide strongly with the cultural reverence of the tiger's form. This form resembles the tiger's actual form, but differs very much in terms of utility. The tiger within our imagination can serve us any way that we seek. The tiger within nature is off limits to us, in one sense, and exists for itself and its ecosystem. If alpha predators were to vanish from the Earth, we won't have merely gained deliverance

⁹² Kellert and Wilson, Eds, *The Biophilia Hypothesis*, 1993.

from their evil clutches, we will have lost a very integral part of our history, culture, and consciousness. Alpha predators keep us humble.⁹³

Conflict and fascination have been constant companions in the history of relations between humans and tigers. Our knowledge of the tiger has emerged stronger with each generation. People's beliefs and understanding of tiger biology and ecology have changed along with their methods for capturing data. Social and scientific ideas influence how people perceive of and treat the tiger. Chapter two considers ecological and ethical issues pertinent to South China's rewilding and reintroduction plan.

⁹³ Quammen, *Monster of God*, 2003.

CHAPTER TWO

FIRST PERIOD: PERSECUTION AND CONSERVATION IN BRITISH INDIA 1800-EARLY 1900s

The second chapter established paradoxical qualities inherent in the human-tiger relationship and outlined the history of violent encounters, and our mental perceptions, that led to massive decimation of tiger populations throughout all of their native ranges. The stories of the tigers of the nineteenth-century are relayed in the pages of hunters' journals. These prominent works contain some of the earliest recorded face-to-face contact between human and tiger. This chapter will focus on the ideals and contributions of hunter and conservationist Jim Corbett and will examine the social and political paradigms that made Corbett's example particularly poignant. The life and work of Jim Corbett shines as a testament to the fluidity of human ideals.

Governing the man-eating tiger

The Mughul Empire in India during the seventeenth century is a historically rich avenue for exploring human and animal relations and is representative of many of the ideals that flourished in the early to middle nineteenth-century. As weaponry became more sophisticated, men, particularly of royal descent, hunted wild animals in the forest to keep their minds, bodies, and reflexes sharp.⁹⁴

Indian forests were cleared more extensively under British Colonial rule than during any period before or since. Governmental interests were largely tied up in accessing and cultivating the spoils of the forest. Forests have always been an invaluable resource for

⁹⁴ Burton, *Book of the Tiger*, 1933; Marchant, *Man and Beast*, 1966; Ramgarajan, *India's Wildlife History*, 2001.

humans to draw upon for a cornucopia of needs. Humans placed value on the forests as a source for many commodities, including tigers. Hunting pressures also accompanied the deforestation of British Colonialism. Between the eighteenth and nineteenth centuries, entire forests were cleared for timber and cash crops in India and other parts of Asia, and tiger hunting for sport and perceived necessity abounded.

Indian wildlife expert Mahesh Rangarajan pointed out that when major famine struck during the British conquest of India's Bengal region, a large amount of farmland reverted to jungle. Naturally, tiger populations flourished, but they were so numerous that there was stiff competition for prey and territory. When they began hunting outside of the forest, their cattle-marauding ways became a serious concern for locals. Citizen complaints prompted officials to put out bounties on the tiger, which in turn stimulated revenue. Larger bounties were offered for tigresses and their cubs. The war on the tiger was motivated by self-interest, but it was also a response to the threat the tiger imposed on humans and their cattle – they were considered unwieldy and problematic creatures. Collecting bounty money was an economic boost on a personal and community level, and reinforced the idea that a dead tiger was worth more than a living one. The tiger's elimination became the blessed elimination of human imperial pride.⁹⁵

During the nineteenth-century, tiger hunting was one of the most “visible spectacles of political authority.”⁹⁶ It is, therefore, logical that tiger hunting and collecting is to be understood within prevailing political, social, and economic contexts. The Indian

⁹⁵ Rangarajan, *India's Wildlife History*, 2001.

⁹⁶ Pandian, “Predatory Care,” 2001.

government encouraged its citizens, and tourists, to engage in tiger hunting on the premise that they were too plentiful.

Indian VIPs and tourists (particularly American) were given ample opportunity to taste this Indian pastime. Their “bags” were often quite plentiful.⁹⁷ Valmik Thapar referred to the British as a form of “mafia” helping themselves to their “share of the spoils.”⁹⁸ State-sponsored massacre of wild tigers was responsible for massive wilderness onslaught. Most who hunted tigers during this period collected their “trophy” kills without thought of a need to conserve what was there.⁹⁹ Throughout much of the nineteenth century, flora and fauna were perceived as rich, plentiful, and diverse. The forests were, by all accounts, teeming with tigers and their prey species.

Frequent hunting expeditions were so bountiful through the 1800s that late in the century the government sent scouts into the forests to account for damages and assess the state of the wildlife therein. These perfunctory visits served a dual purpose. In addition to a report on the state of the forests, scouts often returned with timber. Scouts and hunters almost always entered the forests on the backs of elephants, rather than on foot. The Indian government generally took some type of action toward minimizing the danger to local people from dangerous predators.

During this period of frequent trophy hunts,¹⁰⁰ it was also not unusual for tigers to enter human villages and maim or kill people. In such instances, the government typically

⁹⁷ Rangarajan, *India's Wildlife History*, 2001.

⁹⁸ Valmik Thapar, *Battling for Survival: India's Wilderness Over Two Centuries*, 2003; Mahesh Rangarajan, *India's Wildlife History*, Delhi, Permanent Black, 2001.

⁹⁹ Corbett et al, 2002; Elgin T. Gates. *Trophy Hunter in Asia*. New York: Winchester Press, 1971.

¹⁰⁰ Schaller, *The Deer and the Tiger*, 1967.

sought large-scale retribution for human victims of predation by tigers. Many people consider the tiger to be the most dangerous of the feline family, although tigers primarily attack out of fear and desperation. Their motivations to attack are often difficult to assess, and tiger attacks have been frequent enough throughout the last few centuries to constitute a very real danger for many people. During the early 1900s, records maintained by the British authorities in India show a yearly average of between 800 and 900 human victims.

¹⁰¹ Subsequently, the reaction of governments throughout India's history was to engage in frequent and often publicized tiger hunts.

Bataviasche Courant, Java's official Government Gazette, published an article in 1820 that recommended establishing a "Society for the Extermination of Tigers in Java."¹⁰² This society existed in theory only, yet its ideals were manifested in both government and individual citizens (particularly Europeans). Their anti-tiger sentiment soon influenced others and people occasionally organized extravagant ceremonies for the express purpose of killing tigers. In another case, an official reported that he had "allowed very few of the large wild animals which I have seen in India to escape."¹⁰³

State-sponsored hunting was one way that authorities dealt with tiger-human conflict. Thinning of the tiger populations made the forests safer for removal of timber and other products. Recognition of the need to conserve tiger habitat is important. Unfortunately, anti-poaching laws passed in the 1900s did not prevent many people from setting snare traps "from the mountain-tops all the way down into the valley."¹⁰⁴

¹⁰¹ Alderton, *Wild Cats of the World*, 1998.

¹⁰² Boomgaard. *Frontiers of Fear*, 5, 2001.

¹⁰³ Ritvo, *The Animal Estate*, 1987.

¹⁰⁴ Matthiessen, *Tigers in the Snow*, 62, 2000; Schaller, *The Deer and the Tiger*, 1967.

Power struggles over control of cleared tracts of land in India erupted as a clear division between governing officials and the public, especially farmers. Conflict between the two was at times nearly as great as the battles that kept humans and tigers at one another's throats. The onset of Indian Independence in the twentieth-century introduced governing parties with a more nature-centered approach than the trophy-hunting and timber-mining groups of colonial days. They enacted and enforced bans designed to restrict the use of the forests and protect the tiger from harm.¹⁰⁵ However, many people believed the restrictions to be in direct violation of their inherent rights to land usage. For those depending on open access to the forests, this type of control meant economic and personal hardship. Given this conflict of interest, it is little wonder that local laws then, *and now*, have not stopped illegal poaching and deforesting. The struggles described here is both ecological and personal. Successful bans on natural resources require expert guidance, alternative supplies, and a realistic and flexible plan that is, above all, appropriate to the current social, political, and ecological climate.¹⁰⁶

Early nineteenth-century tiger hunts were often limited to those that were willing and able to brave the dense reeds and thickets of the jungles.¹⁰⁷ This relative inaccessibility was the preferred environment for India's well-known tiger-wallahs. Words and pictures in hunters' journals from this period allow their readers to relive many of these breath-taking confrontations between human and tiger. Richard L. Sutton (1879-1952) sojourned into the trails of southern Asia, recording his experiences and keeping careful

¹⁰⁵ Rangarajan, *India's Wildlife History*, 2001.

¹⁰⁶ *Ibid.*

¹⁰⁷ Thapar *et al*, *Battling for Survival*, 2003.

watch for signs of the elusive tiger. These accounts, although anecdotal, are the first valuable contributions towards building knowledge of the tiger's natural world.

Elgin T. Gates, known to some simply as the “trophy hunter,” wrote of “the breathless, heart-pounding exhilaration of conflict when stalking a man-eating tiger in the depths of his jungle flair.”¹⁰⁸ Early nineteenth-century tigers were initially hunted and killed with bows and poisoned arrows and later, with guns. If practical, the tiger was stripped of its skin. Dangers and triumphs of the hunt are evident in all hunters' tales. Once dead and measured, a photograph of the “bagged” tiger with its proud conqueror was often taken. Classic photographs often depict a hunter standing tall, flanked next to his vertically placed weapon, and above the body of the fallen tiger.¹⁰⁹

The defining relationship between humans and tigers during the nineteenth century was one of spirited battle. Fighting occurred initially within the tiger's forested territory. Before the advent of weapons, humans were at a distinct disadvantage. Possession of a weapon allowed the men to be courageous under these circumstances. Achieving proximity to a tiger and maintaining a steady shot at a distance of less than fifty feet was the pivotal goal of many of these conquests. In this suspended moment of face-off, the scenario could potentially end in death for the human. If the weapon was to fail, or the human hunter falter, the tiger would surely emerge victorious. They knew that they were otherwise defenseless against the strength, teeth, and claws of the charging tiger. The most thrilling aspect for the human hunter is unanimously described in moments of heart-pounding danger.

¹⁰⁸ Gates, *Trophy Hunter in Asia*, foreword, 1971.

¹⁰⁹ Corbett, *Temple Tiger*, 1954; Burton, *Book of the Tiger*, 1933; Gates, *Trophy Hunter*, 1971.

Raising the rifle and resting my elbows on my knees, I took careful aim at the sound the tiger was making, and while holding the rifle steady, turned my right ear to the sound, and then back again. My aim was a little too high, so lowering the muzzle a fraction of an inch, I again turned my head and listened. After I had done this a few times and satisfied myself that I was pointing at the sound, I moved the muzzle a little to the right and pressed the trigger. In two bounds the tiger was up the twenty-foot bank. At the top there was a small bit of flat ground, beyond which the hill went up steeply. I heard the tiger on the dry leaves as far as the flat ground, and then there was silence. This silence could be interpreted to mean either that the tiger had died on reaching the flat ground or that it was unwounded. Keeping the rifle to my shoulder I listened intently for three or four minutes, and as there was no further sound I lowered the rifle. This movement was greeted by a deep growl from the top of the bank. So the tiger was unwounded and had seen me...I was now possibly no more than eight feet above ground ...and some twenty feet from me a tiger that I had every reason to believe was a man-eater was growling deep down in his throat. The near proximity of a tiger in daylight, even when it has not seen you, causes a disturbance in the bloodstream. When the tiger is not an ordinary one, however, but a man-eater...the disturbance in the blood stream becomes a storm.¹¹⁰

Despite, or perhaps because of, the danger that Corbett portrays here, hunting maintains its stronghold on the human imagination. Much of the literature to which Matt Cartmill refers reminds us in his analysis of the hunting hypothesis that the true essence of hunting, at least for the human, transcends the singular episode of killing and dying. For many, the act of moving through the forest seeking contact with animal life within is a spiritual awakening of sorts. In this way, the act of hunting animals is highly symbolic of self-perception and awakening. Cartmill portrays the human hunter as balancing vicariously between wilderness and civilization. He implies that while humans

¹¹⁰ Corbett, *Temple Tiger*, 48-49, 1954.

compulsively seek contact with animals, they kill them in an unconscious and vain attempt to kill, or control the wildness within.

Cultural ideals strongly influence where the dividing line between man and nature rests at any point in history. Hunters of the nineteenth-century apparently thrived on the vital exhilaration of connecting dangerously with raw elements of the wilderness. The writings of Jim Corbett, Billy Arjan Singh, and the others in the wild group illustrate this. They appear to revel in a sense of connecting to their inner wildness through these encounters. Moreover, these men did not fail to consider the sacrificial element of the each magnificent tiger's demise. They hunted tigers much as the tigers hunted their own prey, with one-on-one contact and genuine appreciation for the life-death edge on which each encounter was precariously balanced.

Throughout the last several centuries, humans have erected barriers between themselves and nature (and between tigers and nature!) *Homo* evolved alongside the feline species and should not be excluded from this instinctually-driven flesh-eating category. Along the way, the evolving *Homo* developed physical, spiritual, and psychological coping tools to help them deal with active forces in their environment. Although man has always been potential prey for predators, we are not the primary prey on which they evolved to depend upon. The tiger's diet is diverse but typically includes deer, gazelle, tapir, and wild boar. However, when motivated by extreme hunger, tigers kill whatever animals are nearby. So-called "man-eaters" tend to occupy larger ranges, which, unfortunately, include areas occupied by humans.¹¹¹ In the absence of alternatives, tigers seem to overcome their

¹¹¹ Singh, *Tiger Haven*, 17, 1973; see Lamar Underwood's (Ed.) *Man Eaters: True Tales of Animals Stalking, Mauling, Killing, and Eating Human Prey*, New York: Lyons, 2000 for gory examples or predation by various predators.

natural fear of man. Once this happens, or if fear is not manifest in an individual from the beginning of its life, humans can easily become “just another flavor of meat.”¹¹²

Man-eaters comprise a relatively small percentage of the tiger population. When tigers break humanity’s sacred rule, it causes fundamental tension that can result in human-tiger conflict. Tigers cannot observe the “divine order” banning assault on (dead or alive) human flesh.¹¹³ Punishment for this form of sacrilege for tigers during the nineteenth-century and twentieth centuries entailed individual as well as mass extermination. It is important to understand that a tiger can only be as innately evil as the human ascribing those qualities purports. Tigers in Imperial India in the nineteenth-century were considered by many, from the government down, as inherently evil; worth more dead than alive. Herein exists yet another subjective paradox. A tiger that attacks and kills a human offensively for the sake of its own welfare is considered a maneater whereas a human, killing tigers in the name of sport, or science, earns the title brave.

Humans simply cannot tolerate allowing free reign to any creature that threatens their community welfare, which seems to them to be reasonable. The way that humans have dealt with large, potentially man-eating predators comprises an important area of our joint history. Any discussion of man-eating tigers is not complete without an introduction to one of the most prolific individuals of the period, a hero who figuratively and close to literally released entire villages from the jowls of the tiger.

¹¹² Quammen, *Monsters of God*, 13, 2003; See his discussion of the term man-eater, p.1.

¹¹³ Ritvo, *The Animal Estate*, 30, 1987.

Jim Corbett and the tiger-wallahs, a.k.a. “the wild bunch”

Edward James Corbett (1875-1955), known to most as simply Jim, was a true humanitarian who risked his life repeatedly on behalf of poor and powerless villagers in India. Corbett’s life and work can be analyzed as an early phase in humanity’s shift in perception toward the mighty hunters of the jungle. Well-known for his tiger-hunting prowess, Corbett was often commissioned by the government to dispatch particularly troublesome “man-eating” tigers. The government was willing to dole out large rewards for any man who could dispatch the troublesome tigers, but Corbett continually refused to accept payment. The government first enlisted Corbett’s help with problem tigers around 1906. Often, local citizens would enlist Corbett’s help with their problem tiger by presenting him with a petition. This action shows that feelings toward tigers were common enough to warrant an organized effort uniting the Indian villagers with the government. The Colonial rulers and indigenous people generally agreed that tigers known or suspected of killing people or cattle should be destroyed.

Jim Corbett was a man who truly loved tigers. Yet, he hunted and killed them. And he valued and protected them. These terms are not as contradictory as they may appear. Corbett was a product of his culture and his relations with tigers were consistent with the actions of others at the time, but Corbett’s legacy stands out above the rest. He felt a strong allegiance to the local villagers, and prided himself on being able to spare their lives, particularly innocent children. During his period of service in this manner, he repeatedly released entire villages that quaked under the control of a tiger that had resorted to man-eating.¹¹⁴

¹¹⁴ Corbett, *Temple Tiger*, 1954; Thapar, *Tiger*, 1993.

Corbett became an instant folk-legend in 1937 when he shot and killed the infamous Bengal tigress believed responsible for the deaths of 436 men and women. Another well-known example of Corbett's hero status is the story of the man-eater of Champawat. This tiger so terrorized the village that the streets were empty much of the time and none dared venture outside alone. Corbett located and shot her after she attacked and killed a young girl who was gathering firewood.¹¹⁵

Corbett was the first to introduce physical distress as the reason that many tigers become man-eaters. He believed that man-eating tigers were "made and not born" and that much of their desperation was forced by injury caused by traps, snares, and injury inflicted upon them by man.¹¹⁶ Many of the corpses he inspected lent support to his theory. For example, close-up inspection of the corpse of the man-eater of Champawat revealed broken upper and lower canines on both sides. In the Kumaon hills, where Corbett shot many of his man-eaters, deer were found to be scarce and the terrain difficult for stalking.¹¹⁷ Corbett publicized the reality that most man-eating could be explained by the presence of broken or diseased teeth, bodily injury, or some other handicap that hindered the tiger's ability to handle their natural prey.¹¹⁸

Corbett worked from a philosophy deeper than those who simply stalked and killed large numbers of tigers. Though he believed strongly in helping people who could not defend themselves, he also respected the nature of the tiger. Corbett understood that protection of cubs and guarding of fresh kill caused tigers and tigresses to behave

¹¹⁵ Corbett, *Temple Tiger*, 1954; Thapar, *Tiger*, 1993.

¹¹⁶ Singh, *Tiger Haven*, 117, 1973.

¹¹⁷ Singh, *Tiger Haven*, 1973.

¹¹⁸ Corbett, *Temple-Tiger*, 1954.

aggressively, and he did not feel that their defensive actions necessarily warranted his killing them. It is evident from his writings that he felt torn at times between his duty to protect his fellow humans and his self-acknowledged high regard for tigers.

Although Corbett published accounts of his thrilling hunts of the man-eaters¹¹⁹ of Kumaon and bagged no less than fifteen tiger “trophies,” he was truly a conservationist at heart.¹²⁰ Corbett grew concerned as hunting parties grew numerous and the forests began to recede. He valued the forests highly, and viewed the tigers within as worthy adversaries. The turning point for Corbett came during the early to middle of the twentieth-century when he saw the non-sustainability of the wide-scale hunting expeditions and massive forest clearing. He knew that the eradication of the wild tiger meant no tiger to revere – and no tigers to battle. He feared, rightly, that contact of this nature would be lost forever.¹²¹

Disturbed by increasing commercialization and hunting within the Indian forests, Corbett became an active spokesperson on behalf of preserving the wilderness of India. His life’s endeavors are analogous to those of Aldo Leopold¹²², who is well-known for his dedicated conservation pursuits. In the early 1930’s Corbett took part in the creation of the park that was later named after him.¹²³ The story of Jim Corbett signifies a point of transition in thought toward wild tigers. This shift in perception is evident through the

¹¹⁹ Corbett, *Temple-Tiger*, 1954.

¹²⁰ Singh, *Tiger Haven*, 1973.

¹²¹ Corbett, *Tigers and Tiger Wallahs*, 2002.

¹²² See Aldo Leopold, *A Sand County Almanac*, New York: Ballantine, 1986.

¹²³ *Corbett National Park* was originally named *The Hailey National Park*, after Sir Malcolm Hailey, Governor of the United Provinces.

context of the circumstances and events of Corbett's life but emerging consciousness took quite a bit longer to seep into mainstream thought.

The writings of tiger expert Arjan Singh and conservationist Peter Jackson support Corbett's premise of the cause of man-eating in tigers. In one account, Singh described the injuries of a young tigress with a man-eating reputation. Her jaw had been partly shattered by a bullet, and she had survived that way for more than a year. Jackson describes several instances of man-killing and man-eating in the Sundarbans where the tiger was found to have broken and diseased teeth or other injuries.¹²⁴ The writings of Corbett, Singh, and Jackson describe a change in attitude and deed as part necessity and part nature.

For humans, hunting is rarely about survival. Man has long defended his inclination to hunt, citing evolution, or instinct. Although this view remains controversial, "the hunter is still with us. It is the perversity of human nature that the role of the destroyer carries a greater illusion of power than that of the preserver."¹²⁵ A significant change in the way that humans hunted tigers in the wild is evident through the example of the wild bunch, and others. Formerly avid gun-toting hunters transferred their energies to the art of preservation and began to hunt tigers with photographic equipment rather than weapons. Rather than the customary bag, they would return with photographs and exciting tales of the danger inherent in sneaking up on and photographing a tiger engaged its daily habits. Singh explain the outcome of the new style of hunting as possessing the essential ingredients of a thrilling hunt, and infinitely more rewarding.

¹²⁴ Jackson, *Endangered Species: Tigers*, 1991; Rangarajan, *India's Wildlife History*, 2001.

¹²⁵ Singh, *Tiger Haven*, 185, 1973.

Corbett and a group of men Valmik Thapar referred to as “the wild bunch,” are probably the reason that *any* tigers remain alive in the jungles of India today.¹²⁶ Their dedication and love for the Indian wilderness did not reflect the view of the government or the majority of citizens. The strength of their influence is, therefore, legendary. Disgusted with rapid de-forestation and mindless tiger slaughter, they dedicated a significant portion of their lives to conserving tigers – and the forests. Their impact is particularly notable given the fact that since gaining independence in 1947, India has retained almost all of its wildlife; the cheetah is one exception.

Shooting tigers – with a camera

Shifting perceptions around this time widened to include a worldview seen through the lens of a camera rather than the site of the big game hunters’ rifle. The camera became a tool used to record animals as well as changes in the landscape. Increased coverage of the natural world helped to educate a broader public, which in turn generated a renewed conservation ethic.¹²⁷ The advent, and continual improvements, in photographic equipment and knowledge meant that hunters could document the wildlife they encountered – without the need for the demise of human or animal.

F.W. Champion worked as an officer with the Imperial Forest Service in the Central Province of India but is best remembered as the pioneer wildlife photographer in India. He is credited with inspiring Corbett to replace his gun with a camera. He published

¹²⁶ Thapar, *Battling for Survival*, 2003.

¹²⁷ Rangarajan, *India’s Wildlife History*, 2001.

a book¹²⁸ describing his adventures hunting tigers and other wildlife through the lens of his camera. It contained many of the same elements found in hunters' journals of the same period. Champion's instruction on how to safely and effectively flush out tigers out for photo opportunity is instrumental to this story. The manual offers timeless advice for stealthy movement, positioning, and how to "shoot" undetected so as to photograph the tiger before it detected you and fled – or attacked. This metamorphosis of intent culminated in the thrill of the hunt and capture but with sustainable results for *both* species. This important transition opened up new avenues for gaining ecological knowledge of the habits of the tiger.

Late in the nineteenth-century, as interest in the tiger's ecology grew, the traditional pastime of tiger hunting was slowly supplemented with study. Tiger carcasses came to be valued by zoologists and naturalists. Data was sometimes collected from the trappings of hunters. Unfortunately, in the time it took to gather and analyze data, a subspecies could literally be driven to extinction. This is believed to be true in the case of the Bali tiger, which vanished so quickly once its numbers began dropping that there was almost literally no time to assess the situation long enough to develop a strategy for saving the subspecies.¹²⁹

Emergence of the reserve

Conservation efforts within India have culminated over several centuries. There have been several major phases in which the governing party initially hindered conservation, but later devoted aid to the cause. India established laws to protect forested lands while India was

¹²⁸ F.W. Champion, *With a Camera in Tigerland*, 1927.

¹²⁹ Boomgaard, *Frontiers of Fear*, 2001.

under Britain's rule. Other governments throughout Asia also placed restrictions over what remains of tiger habitats. Construction and maintenance of reserves is an important aspect of making co-existence possible, and should provide the tigers with what they need for life while allowing humans and tigers respite from the other. Even where enforced, however, these restrictions have not prevented the decline of tiger populations from within protected areas. There is one known exception to this.

India's first national park, Corbett National Park, was established in 1936 in an area called Uttaranchal at the foot of the Himalayan Mountains. In 1973 it was used to house the nation's first tiger sanctuary through the support of Project Tiger. Between 1999 and 2003, India lost over 200 tigers to poachers, the larger picture shows around 1,500 poached in the last century. According to a census conducted in 2003, 143 tigers lived in Corbett's sanctuary. Amazingly, no instances of tiger poaching have ever been reported at Corbett. Forest officers at the park credit the diligence of anti-poaching squads for the lack of losses within the park.¹³⁰

Since the conception of Corbett National park, a number of tiger reserves throughout India receive support from Project Tiger. These include: Bandhavgarh National Park, Kanha National Park, Ranthambore National Park, Sariska Wildlife Sanctuary, Sundarbans National Park, Bandipur & Nagerhole National Parks, Dudhwa National Park, Manas Tiger Reserve, and Nandankanan Zoo. Seven national and fourteen local nature reserves exist in China, encompassing a total of 5,000 square kilometers. This area is routinely patrolled by teams of law enforcement officials. Reserves in China include: Yihuang Nature Reserve, Fengyangshan-Baishanzu Reserve, Luoxiao Mountain Reserve, and Meihua Mountain Reserve.

¹³⁰ www.savechinastigers.org

According to the law for Protection of Wildlife of the People's Republic of China, the tiger is regarded under the first level of protection. Under this level, humans are prohibited from hunting or killing tigers. Crimes against the tiger are covered by additional insurance of inclusion on the list of Wildlife Under National Importance Protection. According to the criteria of this list, violators face up to seven years imprisonment if convicted of hunting or killing a tiger, possessing tiger parts, or engaging in commercial trade of tiger parts.¹³¹

Despite widespread campaigns, laws, restrictions, and bans put into effect as early as the nineteenth-century, tiger poaching is still rampant, and human-tiger conflict continues to be a problem. It seems that the closer people live tigers in the flesh, the more difficult it is to convince them that priorities can and should be shifted to value the live tiger more than the dead tiger. As Berger notes, the only class of humans who retain first-hand knowledge about dangers that accompany close approximation to tiger's are, in general, villagers who live near inhabited reserves. It is unfortunate, although understandable, that local people resent these reserves. For many of them, boundaries represent unfair restrictions on useful materials. Reserves are also resented for the tigers they harbor that wander outside of reserve limits and kill their livestock. During the late 1980s, the government of India tried to mediate this tension by compensating farmers in building materials.¹³²

The next chapter begins with a description of the tiger's behavior and role within its wild habitat, and then transitions to its captive habitat in the zoo. Thus far we have seen tigers hunted in nature outright and defensively, and treated as commodities to fill material

¹³¹ www.savechinastigers.org

¹³² Fiona Sunquist and Mel Sunquist, *Tiger Moon*, Chicago: University of Chicago Press, 1988.

and economic needs and demands. The nineteenth-century was also a time of increased interest in exhibiting animals. Chapter three discusses how human perception and tiger behavior are affected by exhibit design change and enrichment, and considers the growing role of science and conservation in zoos. This topic is usually divided between two general groups. There are those who think zoos are beneficial to both humans and animals, and those who target zoos as taking on an impossible task of replicating nature and letting both human and animals down in the process. As tiger populations plummet, journals report each step bringing them closer to their complete decimation. The zoological institution, according to its advocates, grows in its mission to conserve tiger genetics from the inside while conservationists rush to keep them safe within their wild niches.

CHAPTER THREE

SECOND PERIOD: CAPTIVE WILD early 1900s-1970s/1980s

“Nature needs predators. Without them, the web of life breaks down. Like gardeners, they strip and cull and shape. This is the great paradox. Without death there can be no life.”

Michael Robinson

Growing to understand the biological tiger and its ecological tiger: biodiversity matters

Increasing ecological studies undertaken on wild and captive tigers within the past fifty-years have allowed us to further our understanding of their complex behavior, physiology, and psychology. Recent empirical studies focus on the tiger’s living adaptations in response to the increasing fragmentation of their forests. Yet, the importance of the tiger in its niche has historically been overlooked in favor of its reputation as a pest.¹³³ Focusing on tiger qualities that present danger to humans has forced many to neglect the tiger’s ecological importance.

In his book on the natural history and conservation of the tiger, conservation zoologist Dr. K Ullas Karanth writes that, “Wild tigers are the warning lamps that indicate how healthy natural landscapes continue to remain in the face of our onslaught.”¹³⁴ Central works by Kailash Sankhala, Peter Jackson, Peter Matthiessen, K. Ullas Karanth, and Valmik Thapar explore sustainable conservation options with special consideration given

¹³³ Peter Kareiva and Simon A. Levin, Eds. *The Importance of Species: Perspectives on Expendability and Triage*. Princeton: Princeton University Press, 2003; see also Rangarajan, *India’s Wildlife History, 2001* for a discussion on the “flesh-eater that dared to eat people.” (25)

¹³⁴ Karanth, *The Way of the Tiger*, 2001; Matthiessen, *Tigers in the Snow*, 2000.

to the ecological niche filled by the tiger. As top predator, and umbrella species¹³⁵, in its habitat, the tiger is a necessary stabilizer for the health of its ecosystem.¹³⁶ Top carnivores hold the ecosystem together and are also the first to suffer at signs of ecological erosion.¹³⁷ Tigers thrive in their jungle habitat with ample amounts of territory as well as prey whose populations they naturally regulate.

Tigers hunt to live, and voracious hunters they are. They are not biologically wired to view the plight of their prey with compassion. They do not torture their victims or unduly instill fear. Tigers roam the forest on a singular and solitary mission, stalking and capture their prey under dense jungle canopies. When not sleeping, they cross and re-cross their defined territory. Finding a tiger in the forest is challenging because of the tricks their double-patterned stripes can play on the eyes.¹³⁸ Tigers rely on stealth when stalking prey. They do not walk so much as glide across the ground, using their keen sense of hearing to align their movements with other sounds of the forest. Many published accounts note the tiger's hearing as sharp enough to distinguish the rustling of the leaves from dry twigs underfoot, and the footsteps of potential prey from all others. The tiger's eyes are quick as well, and able to detect the slightest movement. Though their world has shrunk considerably, and many facets of their lives continue to change, the basic life of the wild tiger continues.

¹³⁵ An umbrella species is species whose impact on other species on its environment is so great that its extinction threatens the ecosystem of which it is a part. Likewise, its abundance ensures the health of its ecosystem.

¹³⁶ Kareiva&Levin, *The Importance of Species*, 2003; Boomgaard, *Frontiers*, 2001.

¹³⁷ Edward.O. Wilson, *The Diversity of Life*. Cambridge: Harvard University Press, 1992.

¹³⁸ Sankhala, *Return of the Tiger*, 1978.

Tigers in reserves exist in a vulnerable state where wild, managed, and the unknown all converge. In this world, the world's largest cats stalk into the night as they have for centuries. In an instant, a herd stampedes, and birds take flight. Momentarily, forest life has resumed and the tiger sinks his teeth into the body of his victim. This scene, played countless times under the shelter of forest canopy, has been altered. Because "the tiger on the move is the cause of alarm to all jungle species,"¹³⁹ panicked animals can, and do, sabotage its success. Likewise, prey animals sometimes catch scent of the tiger and react accordingly. If the prey animal is quick enough to escape the tiger's deadly clutches, a short but spirited pursuit usually ensues before the tiger gives up and waits for its next opportunity.¹⁴⁰

Accounts of the tiger's killing method vary in some respects, but share a few basic details. The massive jaws of the tiger crush the throat or snap the spine.¹⁴¹ Asphyxiation is quick. Dragging the kill to a private hideout, the tiger will typically guard it, and pick the carcass clean over two to three days. Sankhala¹⁴² observed tigers killing every three to four days, on average, during which time the jungle comes alive with heightened panic, and then settles again. Unless they feel threatened or are stalking their next meal, tigers generally do not kill¹⁴³ and they are usually sated for several days after procuring a sizeable kill.

¹³⁹ Arjan Singh, *Tiger Haven*. Harper & Row, 1973.

¹⁴⁰ Liz Laidler and Keith Laidler. *China's Threatened Wildlife*. London: Blandford, 1996.

¹⁴¹ Sankhala, *Return of the Tiger*, 1978; Singh, *Tiger Haven*, 1973; For varying accounts of the tiger's killing methods see Baldwin, Brander, Burton, Corbett, Fletcher, Forsyth, Sanderson, and Sunquist.

¹⁴² Sankhala, Kailash. *Tiger! The Story of the Indian Tiger*. New York: Simon and Schuster, 1977.

¹⁴³ Jim Corbett, *The Temple Tiger*, 1954.

Once the tiger has successfully subdued his prey, forest activities generally pick up where they left off.¹⁴⁴ Studies on forest dynamics indicate that forest inhabitants respond to the actions of the hunting tiger in their midst with tacit awareness of its intent and purpose. This is proof of the symbiotic nature of the ecosystem. The predation of the tiger is the natural way of jungle life. Even though the tiger's encounters with other species often end in death, these interactions define the natural order. This order is perhaps best explained by Charles Darwin's theory of natural selection, or survival of the fittest. However, natural predator-prey contact bears little comparison to the human-tiger conflict. For one thing, the tiger's predation does not endanger the short or long-term survival of prey species, nor does it compromise the tiger's integrity. In fact, the tiger's natural predation habits benefits the prey species.¹⁴⁵

The flow of an ecosystem left alone to its own devices presents an important lesson for human populations who live in villages neighboring tiger populations, especially those who consider tiger habits to be at least as important as statistical data. Just as prey populations are probably safest when tigers are occupied, or sated, so, logically are human populations. All of this is dependant, of course, on the availability of adequate territory. Adequate territory provides space for many single occupancy male tracts, with room for overlap into those of neighboring females. Large territorial areas mean less competition for food, and more chance of catching prey animals unawares. Home-range sizes fluctuate and depend on habitat type.

¹⁴⁴ Jackson, *Endangered Species: Tigers*, 1991.

¹⁴⁵ Karanth, *The Way of the Tiger*, 2001; Matthiessen, *Tigers in the Snow*, 2000.

Kailash Sankhala, who has worked tirelessly for decades towards the preservation of tigers in India, lists the following as innate qualities of successful predators: “acute sensitivity, secretiveness, the ability to surprise, untiring perseverance, agility in attack, the tenacity to follow and the strength to overpower.”¹⁴⁶ According to his definition, the basic life of a tiger can be thus summed up in one simple equation: *Roam. Stalk. Kill. Eat. Rest. Repeat.* The actions of tigers are, therefore, somewhat predictable under normal circumstances. Relatively frequent and successful hunts are required for their survival. However, although their bodies are designed for speed and equipped to kill, tigers do not procure every meal that they attempt. Researchers estimate that for every ten stalking situations attempted, nine of those would-be preys manage to escape.¹⁴⁷

Tigers tend to stay within the limits of their home range unless pursuing a tigress in heat, or when prey-base quantities are insufficient. Through the dual-process of calling and scent marking, tigers define themselves and others by the “sequence of places visited at regular intervals in search of prey.”¹⁴⁸ Tigers roam freely across their marked territory, often returning habitually to waterholes and places of prey density.¹⁴⁹ Tigers sometimes wander into human territory.¹⁵⁰ The limits imposed by the government are given even less consideration by the tiger than by the poacher. Tigers do not acknowledge posted

¹⁴⁶ Sankhala, *Return of the Tiger*, 17, 1978.

¹⁴⁷ Valmik Thapar, *Tiger: The Ultimate Guide*, New York: Two Brothers Press, 1993; Reginald G. Burton, *Book of the Tiger*, New York: Houghton Mifflin Company, 1933.

¹⁴⁸ Gee, *The Wildlife of India*, 57, 1964.

¹⁴⁹ Gee, *The Wildlife of India*, 1964.

¹⁵⁰ Jim Corbett, *Temple Tiger: And More Man-Eaters of Kumaon*. Oxford: Oxford University Press, 1954; Schaller, *The Deer and the Tiger*, 1967; Singh, *Tiger Haven*, 1973.

boundary markings or obey laws, nor do they sanctify the human form. They merely try to survive as best they can with the genetics that they have inherited.

The zoo: phases of exhibiting, knowing, and enriching the captive environment

Exotic animal collecting as a hobby is nearly as old as human exploration. The hunting, acquisition, and importation of Asian tigers in the early-nineteenth century were a fundamental replication of the frontier experience. One major difference, however, is the fact that boundaries between human and tigers in the past were arbitrary rather than literal. Confinement of the tiger meant that man could visit tiger, but not vice versa. This change swiftly changed human-tiger relations, altering tiger behavior, and influencing human perceptions and values of the tiger. Early wild animal collections called menageries were owned by members of royalty.

Royal menageries of the early nineteenth-century traditionally offered their keepers a taste of the “satisfaction of imperial conquest” in a very different sense than actually hunting them afforded them.¹⁵¹ Initially private, they later became public spectacles amounting to a status competition between the wealthy and powerful. Quality was measured by the wildness of its inhabitants. Large predators, such as lions and tigers, were economic and social boosts to the keeper with the wildest and most expansive collection. Consequently, menagerie keepers strove to display at least one large carnivorous predator.¹⁵² During the Victorian age, the average lifespan for a large cat living in a menagerie was only two-years.¹⁵³

¹⁵¹ Nichols, “Romantic Rhinos and Victorian Vipers,” 3, 1999.

¹⁵² Ritvo, *The Animal Estate*, 1987.

¹⁵³ *Ibid.*

Early menageries housed animals in pits known notoriously for their small, barren spaces, concrete floors, and walls that barely contained room for bodily movement.¹⁵⁴ Exhibits were often arranged in systematically categorized rows according to the current classification model. Menageries were gradually replaced with zoological gardens throughout Europe, which were geared towards public entertainment but also introduced educational aspects.¹⁵⁵ Exhibits were modified during this period, and marked an increase in understanding of the correlation between health, environment and process. Although zoologist Richard L. Garner (1896) and primate specialist Robert M. Yerkes (1925) promoted the importance of the naturalistic environment for captive animals, it was the influence of successful German entrepreneur Carl Hagenbeck, in the late nineteenth century that helped to re-create zoo environments to emulate elements of nature.¹⁵⁶

Hagenbeck's illusion of unmediated nature diverted the visitor's mind from dwelling on the animal's un-natural confinement. He attempted to show how animals co-exist in an ecosystem. He did this by changing the visual landscape of the exhibit. The change involved removing visual signs that suggested captivity, such as bars, in favor of

¹⁵⁴ See Andrews, 1941; John Berger, "Why Look at Animals?" in *About Looking*, 1980; Richard Lewinsohn, *Animals, Men, and Myths: An Informative and Entertaining History of Man and the Animals around Him*, New York: Harper & Brothers, 1954.

¹⁵⁵ Elizabeth A. Hanson, *Animal Attractions: Nature on Display in American Zoos*. New Jersey: Princeton, 2002; For more information about menageries and zoo history see Baratay & Hardouin, 2002; Bendiner, 1981; Blunt, 1976; Deiss, 1996; Kisling, 2001; Lord Zuckerman, 1980; Rothfels, 2002; Heffner, 1999; Hauser, 2000.

¹⁵⁶ Nigel Rothfels, *Savages and Beasts: The Birth of the Modern Zoo*. Baltimore: John Hopkins, 2002; David Ehrlinger, "The Hagenbeck Legacy," *International Zoo Yearbook* 29 (6-10), 1990.

open spaces with natural elements, such as trees and rocks. Landscape immersion¹⁵⁷ was a twentieth-century attempt to “envelop zoo visitors in animals’ environments.”¹⁵⁸ Thanks to Hagenbeck, moats and other invisible means now create the divide between human and beast. Modern zoos offer the visitor the illusion of the tiger in front of them uninhibited by physical constraints. Hagenbeck understood the importance and process of training animals to conform to human expectations. After all, the ways in which visitors perceive and react to the conditions of animal life in the zoo influences the success of that institution and reflects societal values.

Almost from their conception, natural-looking environments were immediately preferred over the harsh implications of barren cell-like cages. Since Hagenbeck’s era of influence, visitor perspectives typically embrace each exhibit update as an improvement over the last. Most zoo survey respondents within the past fifty-years state their appreciation for the natural-seeming qualities of exhibits. By all accounts, panoramic and landscape immersion techniques continue to enhance the zoo experience for its many human visitors.

Raising the question of underlying motivations that humans visit zoos, studying the changes that Rothfels brought to zoo exhibits reveals that society needed an effective camouflage, or antidote, to the depressing atmosphere of zoo collections. Craving retreat from civilized life should not lead to confrontation with the endless chain of human control. Rothfels argues that Hagenbeck promoted naturalistic elements in zoos to increase his economic clout through catering to the visitor’s aesthetic enjoyment. Rothfels influence

¹⁵⁷ This term was coined by Grant Jones.

¹⁵⁸ Hanson, *Animal Attractions*, 175, 2002.

also increased morality towards animals, even if it was unintended on his part.¹⁵⁹ He did this by enabling people to open their eyes a little wider and tuning in empathetically to the needs of the animals.

However, although humans go to zoos to look at animals, they do not generally *see* far beyond outward appearance and behavior. When a look is exchanged between human and animal that reveals too much, boundaries can melt away. When moats began to replace bars in zoos across Europe, and then around the world, a compromise was born that humans *could* handle. Hagenbeck's ideas offered zoo-goers reprieve from unwittingly doubting their own self-identity while gazing into expressive eyes with emotions resembling their own. Humans no longer had cause to believe the story that those sad eyes staring out at them were emitting; the animals' voices, according to Rothfels, were finally silent. These radical changes in the representation of animals in zoos convinced many humans that animals in zoos were happy or content in their forged habitat.

Missions of zoos in the twenty-first century have thus emerged from an historical tendency of public spectacle and entertainment toward wildlife and ecosystem education and captive propagation for scientific purposes.¹⁶⁰ Superior veterinarian care for zoo animals accompanied the transformation of zoo exhibit design. Veterinarians were assigned to augment health matters. Soon, their jobs expanded to encompass consideration for the psychological needs of captive animals.¹⁶¹

¹⁵⁹ L. Jonathan Cohen, Ed. *Interests and Rights: The Case against Animals*, Oxford: Clarendon Press, 1980.

¹⁶⁰ Debra L. Forthman-Quick, "The Role of Applied Behavior Analysis in Zoo Management: Today and Tomorrow" 1984; the health of animals in collections has improved too.

¹⁶¹ Susan D. Jones, *Valuing Animals: Veterinarians and Their Patients in Modern America*, Baltimore: Johns Hopkins, 2003.

The above example shows how the evolution of the human and tiger relations has crossed disciplines -- from one characterized by our domination of them within their natural territory towards a sense of responsibility for their care and protection in a domain of our construction and control. Whereas once human-tiger interaction took place in nature, relations are now generally conducted within the relative safety of restrictive environments. This change is evidence of growing awareness of specific consequences resulting from our pervasive influences on the ecological governance of wildlife. Within the confines of these zoological institutions, humans continue to alter their relations with nature.

During the twentieth-century and into the twenty-first, the conceptual tiger has embedded itself into a strong symbol of conservation within the minds of much of the world. Most of our visual information about the tiger in the wild comes from media sources, many of which include narration to boost our knowledge of the tiger's habits in the wild. Tigers in captivity present a very different image to the human eye than to the human mind. What do we see when we look upon their form and into their eyes? Most of us are innately uncomfortable with similarities *and* differences that we see reflected in the eyes of captive animals, and the tiger is no different.¹⁶² We have controlled the tiger's living conditions to enable easy access for public viewing, although what zoos offer is only a fraction of the truth. The popularity of zoos indicates that this contact fulfills a particular need for our individual and collective psyche. There has been a great deal of published

¹⁶² Berger, "Why Look at Animals," 1980.

support for the argument that the artificiality of our urban lives makes this relationship necessary.¹⁶³

The beauty of the tiger's form captures our imaginations, yet it is difficult for us to conjure a fully realistic picture of the unencumbered life of tiger's long past. Until the nineteenth-century, most people in the world heard tales of tigers through the written and oral tales of hunters and naturalists, or through word-of-mouth. The full integration of zoos into late nineteenth-century societies coincided with the retreat of many animals from daily life. Berger (1980) described the zoo, where anyone could come face-to-face with a living tiger, as a monument to the impossibility of the encounter under any other circumstances.

Tigers living in zoos are viewed as fascinating for their many fans, but they are undeniably out of context. Imagining an encounter with a wild tiger in the sense that early tiger hunters knew is difficult for most of us today. Ironically, zoos provide more humans than ever an opportunity to glimpse tigers in the flesh. People living in cities are generally a car, bus, or metro ride away from an easily obtained vantage-point sighting. Most are in fact only marginally aware of how this experience might be viewed by a time-traveler from the sixteenth-century.¹⁶⁴ Humans tend to accept as natural the culturally constructed habitats of their own time and experiences.

Increased exposure to the tiger effectively alters the feeling of mystery and fear formerly associated with exposure to the tiger in the flesh. Much of the tiger's power is lost in the translation from free to captive. The magnificent tiger that once ruled Asia's forests appears significantly less formidable if we cannot sense personal danger from its razor-sharp teeth and claws or glean certain death from its powerful pouncing lunge. Our

¹⁶³ See Hanson, *Animal Attractions*, 2002; Hediger, *Wild Animals*, 1964.

¹⁶⁴ Norton, *et al*, *Ethics on the Ark*, 1995.

encounters with captive tigers, barring unlikely escapes, are virtually safe. Stringently controlled conditions harness the tiger's killing nature and deny us a truly instinctually driven perception of their true nature. The implications of this include an overall lack of awareness of the true depth of the needs of captive animals by the majority of the non-scientific public.

Tigers that live within the confines of zoo exhibits do not project the magnificent power that made them such challenging conquests to hunters of the jungles in centuries past. A lingering sense of regret for what has been lost has begun to filter through our collective consciousness and is affecting how we feel about the somewhat hypothetical wild nature of tigers. "Ask anyone who's even been in a truly wild place, a place where the land community is still intact (and some members of that community can eat you): ask them if they didn't feel more fully human, more alive *then and there* than ever before."¹⁶⁵

Despite the conflicting messages they are given, citizens of the world today are reacting *en masse* to the urgency of the tiger's plight. This is evident in the concentrated and dedicated interest, effort, and support of so many people today. These include organizations that work to raise public concern and funding, and government, and publicly and privately funded zoological institutions and rehabilitation centers. For a time, tigers in zoos were granted little purpose beyond their symbolism as living proof of humans' dewilding of the forests. As science and conservation combine their talents to try to save the tiger in the wild, however, tigers in zoos may serve a greater purpose after all. Modern zoos study and breed endangered species and collaborate with scientists and conservationists.

¹⁶⁵ Butler, Ed, *Wild Earth*, xiv, 2002.

After two hundred years of tiger slaughter, it is the human propensity to collect and classify that some believe may help to elevate the tiger from its place on the endangered list. Our historical penchant for demarcation and display of natural environment collections has resulted in our placing tigers in the midst of cities worldwide. It is ironic that tigers pushed to the brink of extinction through human manipulation and interference now requires further human intervention for their long-term survival.¹⁶⁶

The zoological institution originally materialized under the rules of a different social construction. Its message of power and dominance is less explicit today. It is generally camouflaged in accordance with the ideals, or delusion most of us use to filter out realities that threaten our sense of security. Whether we recognize and/or admit to them or not, underlying suppositions pertaining to the need for animals in zoos do exist. Kay Anderson (1995) considered the social construction of nature within the confines of the zoo, arguing that the culturally relevant collection of natural forms does not reflect true nature.

The zoo enforces the human tendency to mythologize the animals in our world by enforcing a visually incomplete portrait of how animals really are in their natural habitats. Animals in zoos exist within a pristine area that is routinely maintained. There is no killing or terror in a zoo exhibit. The tacit reality of zoos is that they are essentially the result of artifacts of nature removed from their original contexts and replanted in cities. Captive tigers are an excellent example of this notion: stripped of their need to kill, they appear before us mightily different than if we were to encounter one in the forest.

¹⁶⁶ Norton *et al*, *Ethics on the Ark*, 1995.

Although we can not access the mind of a tiger, we can imagine that it must be different for them as well. Tigers in zoos hover near the edges of their artificial spaces. One writer speculated that they are sensing the real space beyond.¹⁶⁷ There is, of course, no consensus from the tigers. Notions of freedom cannot easily translate to our dealings with animals because we do not know what freedom means to them. Life value is impossible to gauge outside of our own consciousness.

The deal, offered from the human to the tiger, is clear: in exchange for their freedom and independent life and death, we offer them health and secure meals. In exchange for our physical security and unchallenged dominance, we offer them long life. Whether the tiger would prefer to live free or die is therefore not an answerable question.¹⁶⁸ The quality of this life has been a subject of much debate for philosophers, environmentalists, and historians alike. Wild behavior is a product of culture and *not* a recognized zoological classification.¹⁶⁹ Are tigers in zoos wild? Are they domestic? They are neither. Does an environment become a wild place once a tiger lives within its confines? While tigers cannot be *both* wild and tame, they *can* possess elements of both.

For almost as long as there have been zoos, there has been criticism of the issue of spatial limits imposed on animals that would otherwise roam free.¹⁷⁰ However, the notion that wild animals living outside in natural territories do not have limits imposed upon them is erroneous. Further, it lacks present-day ecological knowledge and understanding. Heini

¹⁶⁷ Berger, 23, "Why Look at Animals," 23, 1980.

¹⁶⁸ See R.A. Marchant, *Man and Beast*, New York: The Macmillan Company, 1966.

¹⁶⁹ Mullan and Marvin, *Zoo Culture*, 1987.

¹⁷⁰ Mullan & Marvin, *Zoo Culture*, 1987; Rothfels, *Savages and Beasts*, 2002.

Hediger argues against this popular notion of “absolute freedom of place and person.”¹⁷¹ He explains that geographical regions are broken into habitats, with each species occupying small pieces of that habitat as need dictates and that the prey upon which they depend can inhibit movement for predators. The major point of dissention that critics use to target zoos, regardless of recent innovative design, lies in the removal of the tiger from the system of which it is an integral part. The most inventive exhibit still cannot replicate complex eco-system activity.

Hediger criticized modern-style exhibits furnished with pseudo-natural elements, calling them an “ignorance of the following elementary fact: a cross section of nature is not an equivalent part of the whole, but merely a piece which, on being completely isolated, alters its quality. In other words, nature is *more* than the sum of an infinite number of cages, however natural they may *appear*.”¹⁷² Inquiry into the health and function of tiger’s in both environments reveals fundamental differences and often aids in our understanding of our own motives, values, and social progress. Tigers in cages primarily exist and are perceived to be commodities for human interest. Tigers living wild exist to function as individuals, and they co-exist with many species in a natural environment into which they have naturally evolved.¹⁷³

Carl Hagenbeck’s nineteenth-century transformation of the zoo animals’ environment altered, or trained, their behavior, thus enhancing the quality of the show for the human. Whereas barren and barred exhibits tended to elicit repetitious behavior, access

¹⁷¹ Heini Hediger, *Wild Animals in Captivity*. New York: Dover, 4, 1964.

¹⁷² Hediger, *Wild Animals in Captivity*, 4, 1964.

¹⁷³ Nichols, “Romantic Rhinos and Victorian Vipers,” 11, 1999.

to natural elements inspired signs of natural behaviors. However, individual tigers react to their restricted captive environments in expected as well as *unexpected* ways.¹⁷⁴ The majority have been observed varying their behaviors in reaction to materials designed to stimulate their environment.

Enrichment offerings inspire the tiger to carry on complex behavioral rituals within a relatively simple captive environment.¹⁷⁵ Truly beneficial naturalistic exhibits provide tigers with “biologically relevant stimuli.”¹⁷⁶ Ruth C. Newberry, a comparative veterinary anatomist, defines environmental enrichment as, “an improvement in the biological functioning in captive animals resulting from modifications to their environment.”¹⁷⁷ Current studies suggest that these behaviors are essential for the tiger’s psychological health. Enrichment exercises effectively promote reproductive success, maintenance of muscle tone, and are known to minimize stress, boredom, and disease.

Unlike their wild-living counterparts, the survival of captive tigers does not depend on the manifestation of technical training normally passed from a tigress to her growing cubs. Humans in charge of captive tigers are responsible for the protection, nurturing, and teaching of the individuals in their care. If the keeper should abandon the tiger, the tiger has no option but to starve to death. This has been the historically tragic outcome of extreme circumstances arising from political and societal mayhem, such as war; or natural disasters, such as floods, hurricanes, tornadoes, and fires.

¹⁷⁴ i.e. by becoming inactive.

¹⁷⁵ D. Morris, “The Rigification of Behavior,” *Philosophical Transactions of the Royal Society of London*, 251:772 (327-330), 1966.

¹⁷⁶ Norton *et al*, *Ethics on the Ark*, 223, 1995.

¹⁷⁷ Ruth C. Newberry, “Environmental Enrichment: Increasing the Biological Relevance of Captive Environments,” *Applied Animal Behavior Science* 44 (229-243), 229, 1995.

One of the first challenges for promoters of enrichment involved constructing objects that were realistic enough to stimulate stalking, hunting, and fighting behaviors, and tough enough to “survive” the attack! The use of living prey is preferable to non-living. One such study found that offering live fish to Sumatran tigers increased their levels of activity for several consecutive days.¹⁷⁸ In addition, researchers noted a marked decrease in stereotypic and hyper-aggressive behaviors, and excessive sleeping.

Certain scents rubbed on hard surfaces such as rocks and trees trigger an instinctual territory-marking behavior common to all cat species. Lacking the urgent impetus to hunt, and in the absence of danger from predation, fighting, or starvation, captive tigers risk growing complacent. This is especially true for individuals that were born into their captive environment and were raised by a human zookeeper instead of their mother.

Enrichment methods encourage tigers to interact with introduced elements of their environment in ways that mimic those associated with defensive and offensive predatory response.¹⁷⁹ Enrichment props and activities encourage tigers to display behaviors that are indistinguishable, or closely comparable to those observed in non-captives.¹⁸⁰ When deciding which behaviors to target, zookeepers must also rate behaviors in terms of its importance to the survival of the species. Zookeepers record enrichment

¹⁷⁸ Meredith J. Bashaw, Mollie A. Bloomsith, and Terry L. Maple, “The Behavioral Effect of Reintroduction of a Hand-Reared Lion Cub to her Social Group,” *Animal Keepers Forum* 27:3 (131-135), 2000.

¹⁷⁹ Bashaw et al, “The Behavioral Effects,” 2000; Newberry, “Environmental Enrichment.” 1995; Hal Markowitz, *Behavioral Enrichment in the Zoo*. New York: Van Nostrand Reinhold, 1982.

¹⁸⁰ Hal Markowitz and Victor J. Stevens, Eds. *Behavior of Captive Wild Animals*. Chicago: Nelson-Hall, 1978; Markowitz, “Behavioral Enrichment,” 1982; Lord Zuckerman, *Great Zoos of the World*. London: Westview Press, 1980; Rothfels, *Savages and Beasts*, 2002; Hanson, *Animal Attractions*, 2002.

exercises and reactions thoroughly. Periodic evaluation of these records enables them to spot areas requiring modifications and improvements. These records benefit future goals and plans for each tiger, and data trends at the species level.

Knowledge of both species *and* individual history is important when attempting to target behaviors natural to the species. Long-term observation of both wild and captive tigers is essential for discerning behaviors that are predominantly species oriented, and those that are unique to the individuals. Individuals, particularly in captivity, typically display varying degrees of motivation. Therefore, an investigative approach might involve experiments that offer various levels of impetus.

Ecologists and scientists consider the genetic material of the tiger valuable for future conservation goals. This view has increased scientific efforts to maintain specimens of optimum physical and psychological health, which has in turn aided behavioral research. A wide gulf exists between the lives of captive and wild tigers. This change is evident in the circumstances under which we now forge contact with the once elusively forest-dwelling tiger.

Habitat protection versus captive breeding

Breeding and conservation programs within zoos enabled them to supply their own stock. This work promoted the notion that the maintenance of selected individuals could allow future individuals to roam free in the future as they once did. This notion grew in strength and has affected much research in the area of animal husbandry. To meet this ambitious

goal, enrichment measures encourage behavior in captive tigers to match that of their wild counterparts.¹⁸¹

The zoo institution gradually grew to perpetuate the idea that man was capable of improving on nature's design. When Nigel Rothfels (2002) lamented the tragedy of zoos as final refuges for endangered species, he was suggesting that the un-natural history of animals might be the final history for some – and that we should be concerned about it. Modern zoos supply their own collections from existing biological stock. This means that they no longer participate in tiger-hunting and trapping ventures that took place several centuries prior.

The American Zoo and Aquarium Association (AZA) developed the American Tiger Species Survival Plan (SSP) in 1988 to manage the breeding of healthy tigers, and to help preserve the genetic diversity of the species. The prevailing goal of captive breeding is to maintain physically, behaviorally, and genetically healthy captive species. Individuals are generally not intended to be used to replenish dwindling wild populations. The relatively recent idea that zoo stock can and should be trained for eventual placement into reserves to boost existing wild populations' still meets with skepticism.

Opponents to this view are primarily concerned that the growing prevalence of captive-born tigers in zoos is equivalent to biological and evolutionary corruption of their genetic lineage. They stress that given the danger of the tiger's extinction in wild habitats, scientific and conservation efforts are being wasted on the enrichment, revitalizing, rewild, and reintroducing of captive-born tigers. In their view, the urgency of the situation calls for a strong and focused effort to protect already existing wild populations to help them

¹⁸¹ Dhun and Hema Karkaria, "Zoorasic Park: A Brief History of Zoo Interpretation," *Zoos' Print* xiv: 1, 1998.

flourish naturally. Many of these people do not consider captive-born tigers to be of the same caliber as wild-born tigers and therefore do not believe they are conservationally sound.¹⁸²

Balmford reminds us that captive breeding is costly and that zoos can realistically hope to conserve a limited number of endangered animals.¹⁸³ He outlines criteria for how zoos should prudently decide in which species to invest conservation efforts. Karanth warns that it is more cost-effective to protect habitats for recovery of existing populations. Experts across all of the relevant and participating fields of interest agree that reduction of stress on dwindling and fragmented tiger populations today is as crucial for the tiger's survival as the need for genetic diversity.

Diversity matters

Diversity is an essential component of the tiger's survival, and has immense broader applications as well. For each of the five remaining subspecies, there is reason to believe that they are each descended from a finite number of tigers from a date of the not-too-distant past. The lower this number, the less diverse their genetics, and the more critical their chances of surviving into the future appear. For example, an optimum number signifying high genetic diversity would be 150 currently existing tigers descended from 30 original tigers. Currently, the South China tiger has numbers that are so critically low that

¹⁸² Colin Tudge, *Last Animals at the Zoo: How Mass Extinction Can Be Stopped*, Washington D.C.: Island Press, 1992.

¹⁸³ Andrew Balmford, Georgina M. Mace, and N. Leader-Williams, "Designing the Ark: Setting Priorities for Captive Breeding," *Conservation Biology* 10:3 (719-727), 1996; see also Jeffrey P. Cohn, "Decisions at the Zoo," *BioScience* 42:9 (654-659), 1992.

they are more inbred than diverse. Along with inbreeding come lowered reproduction rates, higher infant mortality, and higher incidences of illness.¹⁸⁴

Talk of biodiversity has only relatively recently crossed from scientific spheres into the public as a crucial aspect of all life. The Earth is an immensely rich place and contains an amazing diversity of organisms. They range in size from the microscopic to animals that outsize and outweigh us tremendously. Science strives to identify, classify, and group these species. Many species are not yet identified by science, and many more very likely exist and then vanish unbeknownst to us. Species are generally genetically adapted to the habitats in which they thrive, and to the myriad organisms with which they co-exist. When their habitats and resources are diminished or altered, biodiversity is jeopardized.

Biodiversity is a system of natural and organic interrelationships that are more complex than anything humans can design.¹⁸⁵ The study of biodiversity, however, includes examining biological mayhem as caused by humans *and* non-human species. The Earth is a living organism, and nothing can remain stagnant on a living organism. Thousands of years have separated modern *Homo sapiens* from a way of life that kept links to that type of connection to the Earth vital. According to the biophilia hypothesis, humans recreate this lost connection to the Earth through the manifestation of symbols and artifacts in their lives. Wilson does not suggest that the connection is totally lost as much as “atrophied and fitfully manifested” in the artificial constructs of our shared environments.¹⁸⁶ This serves

¹⁸⁴ Thapar, *Tiger*, 1993; Tudge, *Last Animals*, 1992.

¹⁸⁵ Edward O. Wilson, *Biodiversity*, Washington D.C.: National Academy Press, 1988.

¹⁸⁶ . Kellert and Wilson, *The Biophilia Hypothesis*, 32, 1993.

to explain why urban dwellers find themselves drawn to zoos and circuses, and why they spend their hard-earned salaries on camping and hiking expeditions in remote areas of the world that do not remind them of their own environs.

Life at the behavior-conservation interface -- linking *in situ* and *ex situ*

Keith Thomas illustrates how humans placate moral dilemmas by confirming their sense of necessity and self-importance.¹⁸⁷ In defining struggles between man and his natural environment, he outlines a profound shift in thought that has aided us in understanding that the progressive expansion of civilization is ultimately disruptive to all of nature, including human beings. As he tells it, it was through this self-recognition that we came to appreciate the importance of conservation efforts to aid in the natural balance. Recognition of the ecological merit of the tiger has been a long and slow process.

Most zoo-based research is applied research, and is meant to deal with specific management issues. Until quite recently, the more theoretical concerns of wild population management and conservation drew from data derived from wild populations. Combining *in situ* and *ex situ* research is an important aspect of the process of saving the tiger.¹⁸⁸ When linked with field studies, research adapts to meet challenges specific to needs of the endangered tiger.

Linking studies of captive and wild populations can optimize strategies for conservation, such as the difficult and expensive ambition of captive breeding for future

¹⁸⁷ Keith Thomas, *Man and the Natural World: A History of the Modern Sensibility*, New York: Pantheon, 1983.

¹⁸⁸ See Gordon M. Burghardt, Joseph T. Bielitzki, John R. Boyce, Dorcas O. Schaeffer, Eds. *The Well-Being of Animals in Zoo and Aquarium Sponsored Research*, Scientists Center for Animal Welfare, 1996.

reintroduction.¹⁸⁹ Combining *in situ* and *ex situ* conservation efforts at the international level is the ambitious goal of the IUCN/SSC CBSG Tiger Global Conservation Strategy (TGCS)¹⁹⁰, developed in 1992. TGCS works to establish a globally viable framework for utilizing economic and zoo resource considerations. This works in areas of distribution, breeding, and captive management programs.¹⁹¹

Very few instances of research within animal zoological collections occurred prior to the nineteenth-century. Potential does exist within cognitive and behavioral research to enhance the psychological well-being for animals housed in zoos through an approach which empowers the animals to “help us care for and learn about them.”¹⁹² Modern zoos provide a common ground for discourses among animal conservationists, ethologists, scientific experts, and the public. Current research priorities include limitations and problems resulting from varying constraints of captive conditions.¹⁹³

Conservation should be “appropriately undertaken in the zoo.”¹⁹⁴ In order for captive tigers to serve as ambassadors for their wild counterparts, research should be conducive to this mission. In order to serve as ambassadors, the importance of the species has to, when appropriate, supercede that of individual tigers. Individual tigers, above all, must be valued for their genetic worth. Furthermore, and according to James M. Rice, zookeeper at the Roger Williams Park Zoo, “Animals in zoos must not be regarded as static

¹⁸⁹ See Tenhumberg et al, “Linking Wild and Captive,” 2004.

¹⁹⁰ The mission of this conservation strategy is supported by the AZA Tiger SSP.

¹⁹¹ Ron Tilson, “Management and Conservation of Captive Tigers,” Chapter 8, 5tigers.org.

¹⁹² Rice, www.psyeta.org, 2005.

¹⁹³ Forthman-Quick, “The Role of Applied Behavior,” 1984.

¹⁹⁴ Glatston & Hosey, “Research in Zoos,” 191, 1997.

monuments to wildlife, but rather as complex and dynamic beings, requiring real *opportunities* and *challenges* to accomplish behaviors.”¹⁹⁵ Despite its basic restrictive conceptual design, modern zoos try to promote species-typical behavior patterns. At the same time they discourage exhibition of disturbing behaviors such as pacing, regurgitation, and self-mutilation.¹⁹⁶

Twenty-first century ideologies transformed zoological parks, most of which are dedicated to educating the people of the world to the plight of wild animals. As self-proclaimed cultural institutions, modern zoos serve society through education, research, science, and conservation. Ecological science, conservation, and widespread concern for animal welfare have greatly affected modern zoological exhibits.¹⁹⁷ Their stated mission has also grown to match current scientific ecological awareness.

Literature suggests that behavioral studies can aid conservation efforts in the following areas: small population extinctions, inbreeding depression, species isolation, predicting consequences of environmental change, retaining cultural skills, behavioral manipulations, reintroduction plans, habitat requirements, exploitation, captive breeding, to name just a few.¹⁹⁸ Behavior-conservation research allows us to focus strictly on behavioral responses to environmental disturbances.¹⁹⁹ It is difficult to understand wild

¹⁹⁵ Hediger, *Wild Animals*, 1954; Markowitz, *Behavior of Captive*, 1978; James M. Rice, “Zoo Husbandry and Research: An Integrated Approach,” *Psychologists for the Ethical Treatment of Animals* www.psyeta.org, Retrieved on 22 Nov, 2004.

¹⁹⁶ Hediger, *Wild Animals*, 1954.

¹⁹⁷ Hanson, *Animal Attractions*, 2002; Bryan Norton, Michael Hutchins, Elizabeth Stevens, and Terry Maple, Eds, *Ethics on the Ark: Zoos, Animal Welfare, and Wildlife Conservation*, 219, 1995.

¹⁹⁸ William J. Sutherland, “The Importance of Behavioural Studies in Conservation Biology,” *Animal Behaviour* 56 (801-809), 1998.

¹⁹⁹ T.M. Caro, “Behavioral Solutions to Breeding Cheetahs in Captivity: Insights from the Wild,” Department of Wildlife and Fisheries Biology, University of California 1999.

behavior patterns from studies conducted in captivity.²⁰⁰ Studies on captive tigers are used primarily for comparisons made with recorded observations of wild behavior to determine possible reasons for fluctuations from normal types of behavior.

Zoos can provide researchers an unmatched opportunity for controlled observation and assessment by making possible certain types of research that would be otherwise difficult to implement.²⁰¹ In 1995, a workshop, funded in part by the Association for the Study of Animal Behavior of Great Britain, took place at Rotterdam Zoo. The workshop offered researchers from zoos and academic institutions an opportunity to explore strategies for theoretical and empirical research for the advancement of animal conservation and management. They considered the zoo arena highly suitable in scientific potential and suitable for research.²⁰²

Bostock²⁰³ divided the studies of inhabitants in zoos into the following seven categories: taxonomy, general observation, breeding technologies, veterinary study, genetics, behavior, and anatomical studies. Observational studies of captive animals often rate frequency of activity within a specified period and then compare the resulting patterns with field studies of the same species.²⁰⁴ Scientists use these comparative methodologies

²⁰⁰ Linda Laikre, "Conservation Genetics of Nordic carnivores: Lessons from Zoos," *Hereditas* 130 (203-216), 1999.

²⁰¹ Hediger, *Wild Animals*, 1964.

²⁰² Angela R. Glatston and Geoffrey R. Hosey, "Research in Zoos: from Behaviour to Sex Ratio Manipulation," *Applied Animal Behaviour Science* 51 (191-194), 1997.

²⁰³ Stephen St. C. Bostock, *Zoos and Animal Rights: the Ethics of Keeping Animals*. London: Routledge, Inc., 1993.

²⁰⁴ Brigitte Tenhumberg, "Linking Wild and Captive Populations to Maximize Species Persistence: Optimal Translocation Strategies," *Conservation Biology* 18:5 (1304-1314), 2004.

to characterize exploratory activities, territorial marking, eating habits, sleeping patterns, and interactions between individuals.²⁰⁵

Additional studies introduce outside elements that test olfactory and auditory responses.²⁰⁶ Preference tests allow the animal to choose between two conditions, both of which may invite the same behavior. For example, the animal can choose which type of bedding it prefers. This can also be effective for determining motivation and comfort, and food choices. When combined, a preference for activity may emerge.²⁰⁷ Zoological studies to emerge out of the late twentieth-century bear a strikingly interdisciplinary design that is consistent with the twenty-first century science paradigm. They can encompass a variety of disciplines spanning the humanities, social sciences, laboratory science, and, recently, archaeology.²⁰⁸

Most of us would agree that specific elements of the zoo, such as its stated missions and physical design, demonstrate an expanded consciousness. Practically speaking, high-quality zoo environments represent opportunities for individualistic and scientific type studies that can aid conservation to an extent that is unparalleled in history. Advantages that work in favor of zoo-based research include the intimacy made possible by the close proximity of animal to researcher, predictability of animal availability, reduced

²⁰⁵ Sarah H. Weller, "Twenty-Four Activity Budgets and Patterns of Behaviour in Captive Ocelots," *Applied Animal Behaviour Science* 71 (67-69), 2001.

²⁰⁶ Deborah L. Wells & Justin M. Egli, "The Influence of Olfactory Enrichment on the Behaviour of Captive Black-Footed Cats, *Felis nigripes*," *Applied Animal Behaviour Science* 85 (107-119), 2004.

²⁰⁷ Harold W. Gonyou, "Why the Study of Animal Behavior is Associated with the Animal Welfare Issue," *Journal of American Science* 72 (2171-2177), 1994.

²⁰⁸ Cornelius Holtorf and David Van Reybrouck, "Towards an Archaeology of Zoos," See also Holtorf, 2000; O'Regan, 2002.

reactive flight potential, and the potential for acquiring individual details.²⁰⁹ In addition, methods and equipment whose uses are difficult or impossible in the field are much more compatible with the zoo environment. Many influencing factors can thus be controlled, or at least diligently noted. Use of restraint and anesthesia, when necessary, can be applied with minimal trauma.²¹⁰

With adequate understanding of the physical and psychological needs of endangered tigers, the zoo can facilitate the development of individuals that possess skills necessary for survival in the wild. Breeding conducted within the *ex situ* setting of the zoo allows scientists to control certain aspects of the breeding program, and thus eliminate problems common in species whose numbers have gotten dangerously low. Some believe that this type of *ex situ* work sets the stage for reintroduction possibilities. The role of zoos to protect the precious genetic material of endangered tigers is especially valuable to ensure diversity and help prevent extinction in the wild. However, obstacles to research in zoos exist. These include inadequate scientific staff, lack of scientific samples; limited displays of natural behavior, time spent acclimatizing for newly attained animals, and breeding difficulties.

Achieving a full repertoire of behaviors in tigers is impossible, but it is important to elicit the most natural behaviors possible when engaging in wild and captive studies. The closer the behavior of the captive tiger is to its wild counterpart, the more effective these studies are for the management and conservation sectors of wild populations. In this way, the individual, population, species, and ecosystem are equal arenas for research to

²⁰⁹ Such as age, weight, sex, and parentage.

²¹⁰ William G. Conway, "Zoos: Their Changing Roles," *Science* 163:3862 (48-52), 51, 1969.

benefit them all. True efficacy of research and conservation programs depends on steadfast commitment to learning what truly benefits the species.

A worthy investigation would study changes in the wild tiger's behavior since the human onslaught on their natural habitat. How much have loss of habitat and prey altered the tiger's behavior? Many of the problems experienced by human populations near forests containing tigers, and reserves, suggest that stresses to their natural environment have influenced tiger behavior. This tension has often caused predation to extend beyond ordinary boundaries. This has had multiple consequences for every phase of conservation efforts, including loss of natural behavior in the wild.

Tiger behavior has undoubtedly changed in response to the captive environment. Yet, enrichment exercises do elicit behavioral responses from captive tigers that are identical to those in the wild, suggesting that tiger behavior retains its fundamental link with survival and instinctual drive. In zoological institutions where realism and landscape immersion dictate exhibit design, fostering human appreciation for the role of tigers in an ecosystem is the desired goal. Zoos do not aspire to literally replicate ecosystem activity, but many try to pay humble tribute. Educational elements of modern zoos are designed to "accentuate the inseparable connection between the survival of animal species and the survival of their wild habitats"²¹¹ and to promote public support and sentiment.²¹²

Recent studies reinforce connections between captive conditions, behavior, and conservation. Captive-born animals are often excellent candidates for studies on instinctual versus learned abilities. Research in zoos can aid science by discouraging unnatural

²¹¹ John Bierlein, "Exhibit Design and the Aesthetic of Nature," *AZA Communique*, 3, 2004; See also John C. Coe, "Design and Perception: Making the Zoo Experience Real," *Zoo Biology* 4:197 (197-208), 1985.

²¹² Conway, "Design and Perception," 1969.

behaviors that could impede research.²¹³ An observational study of wild tigers in captivity concluded that captive conditions that contained little to no enrichment items tended to elicit “stereotypic” behaviors while environments with numerous enrichment devices and exercises inspired “normal” behaviors.²¹⁴ The wild tiger spends most of its time engaged in “appetitive behaviors.”²¹⁵ These activities consist of locating, capturing, killing, and consumption of prey.²¹⁶ Barren and barred exhibits tended to elicit repetitious behavior, while access to natural elements inspired natural behaviors.

“Stereotypic,” or abnormal, behaviors indicate physically or psychological distress.²¹⁷ These cases are often challenging to assess. “Unfortunately, many behaviors that are considered indicative of poor welfare have multiple causes, and the determination of causation has been the focus of much ethological research.”²¹⁸ Increased breeding success among captive tigers was also associated with enrichment offerings. Pitsko’s observational study indicated that healthy captive conditions can potentially aid successful conservation efforts.²¹⁹ Her results were consistent with existing studies linking behavioral response and research.

²¹³ Bostock, *Zoos and Animal Rights*, 1993.

²¹⁴ Leigh E. Pitsko, “Wild Tigers in Captivity: A Study of the Effects of the Captive Environment on Tiger Behavior,” Masters Thesis, Virginia Polytechnic Institute and State University, 2003.

²¹⁵ Bashaw, “The Behavioral Effect,” 190, 2003.

²¹⁶ Bashaw, “The Behavioral Effect,” 2003.

²¹⁷ “Fixed sequences of behavior performed over and over again in the same way with no obvious function,” Marian S. Dawkins, “Behaviour as a Tool in the Assessment of Animal Welfare,” *Zoology* 106 (383-387), 317, 1998.

²¹⁸ Gonyou, “Why the Study of Animal Behavior,” 2174, 1994; see also Dawkins, “Behavior as a Tool,” 316, 1998.

²¹⁹ Pitsko, “Wild Tigers in Captivity,” 2003.

The ultimate test of the benefits of enrichment are, of course, how well an animal that is dependant upon routine care can adapt to a life in the wild. The next chapter addresses a project in South China that aims to take enrichment to an all new level, and considers technical and social risks that threaten the success of the project. The lives of many inhabitants of Asian civilizations are inextricably woven with the lives of tigers. This is especially true for people living near reserves. Though problems and conflicts exist, all countries with wild tigers in their forests have established initiatives to aid in long-term survival. The conservation organization *Save China's Tigers* is just one example of this effort. In collaboration with the Wildlife Research Centre of the State Forestry Administration of China and the South Africa Trust, plans are underway to attempt to supplement the nearly vanished South China tiger by reintroducing individuals into the wild. Selected tiger cubs are sent to learn the basics of survival hunting. Chapter four investigates South China's controversial tiger rewilding project.

CHAPTER FOUR

THIRD PERIOD: REHABILITATING WILD – SAVING SOUTH CHINA’S TIGER late 1970s/1980s-early 2000s

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” – Anthropologist Margaret Mead

The quotation above is striking on two *levels*. First, it inspires us to believe that if humans want something badly enough, it becomes possible. If this is true, the tiger is in good shape. Second, it suggests utilizing this hope to make *change* in the world. What *are* realistic outcomes for the tiger of the future? Should all of these dedicated efforts succeed and suspend the extinction of the tiger, what then? What will be different from this point forward? More to the point, how will *we* be different?

Perhaps we should simply ask of ourselves: what *can* we change? The ideas within this chapter consider current attempts to increase sustainable tiger populations through the process of reinstating essential components of the tiger’s wild nature. This effort is taking place in South China right now. It appears that now that we are sensitive to the direct and indirect effects of our actions. It seems as though humans are anxious to make amends. Nowhere is this more applicable than for the most urgently endangered of the tiger subspecies.

Nature versus nurture and the human-tiger bond: “Tara’s” legacy

The debate over nature versus nurture is one that has spanned centuries, and continues to unite disciplines. Is the tiger’s killing knowledge primarily instinctual or acquired through early training by its mother? Can it be instilled later in life? These questions form the

foundation for the debate over the utility of, and possibility of, successful reintroduction. Pressures on environmental resources have seriously compromised the ability of some tigers to survive. These pressures affect how they feed, raise their young, and avoid territorial conflicts, even with their offspring. Cubs grow to full-size within about 18-months, at which point the males must establish their own territories.²²⁰ Females sometimes live for some time within the same territory as their mother. Persistence and hunting prowess are traits that no wild tiger can afford to lose.

During cub rearing, the tigress tends to avoid all other tigers. The tigresses pregnancy is often a well-kept secret until almost the end, when her belly finally shows evidence of its load. She is usually on her own during pregnancy, and hunting is more challenging for her. No published account describes the event of birth, but a few have witnessed and videotaped newborn cubs. Infant mortality is high and typically blamed on predation from invading tigers, and starvation.²²¹ By eating their fecal matter, she is probably helping to lessen the chance of discovery by predators.²²² The tigress reacts aggressively to anything that she perceives as a threat to her newborns. When Fiona Sunquist, wildlife writer, and Mel Sunquist, wildlife ecologist, were conducting their field study of India's wild tiger, they witnessed the mauling of Kirti Tamang by a tigress who was trying to protect her cubs.²²³

Once their cubs reached an age of less dependence and vulnerability, however, some tigresses have tolerated the presence of field researchers. Raghu S. Chundawat, a

²²⁰ Thapar, *Tiger*, 1993.

²²¹ According to Valmik Thapar, 50% or higher.

²²² Thapar, *Tiger*, 1993.

²²³ Sunquist, *Tiger Moon*, 1988.

wildlife biologist in India, observed a tigress he and his team dubbed “120.”²²⁴ He explained that until about the twentieth day, the mother spends about fifteen hours a day with them. The tigress rarely ventures far when she does go off to find food, until the cubs are three to four weeks old. The tigress is the sole bearer of the responsibility of raising and teaching the cubs. At the approximate age of two and a half months, they are old enough to tag along on her hunting expeditions. Their participation is limited at first, and increases over time. The tigress demonstrates survival skills for her cubs throughout this period, and protects them fiercely from any danger during their joint hunts.²²⁵

For eight to ten months, the cubs rely on their mother to sustain them with her kills. She usually allows them to feed first, and regurgitates the meat for her very young cubs. For much of that time, her milk is supplemental to their raw meat diet. The tigress must feed frequently enough to maintain her own health and that of her brood. Meat requirements for a tigress and her growing cubs are thus quite high. Valmik Thapar described his observations of the dedicated efforts of a tigress encouraging her cubs to engage in the spirit of the hunt. Many experts believe that the tiger’s skills are best fostered under these conditions. However, when that opportunity does not exist, many believe that a captive-born tiger can adapt to a wild existence. One of the most notable examples to this end is the story of Arjan Singh and his beloved “Tara.”

Singh’s experience is a far cry from those of eighteenth and nineteenth-century hunters, who considered the tiger a truly challenging adversary. At that time, the human competed against the tiger’s formidable strength and agility – with fast and deadly weapons. Yet many people have broached tigers with relaxed defenses, and some have

²²⁴ Thapar, *Tiger*, 1993.

²²⁵ Sankhala, *Return of the Tiger*, 1978.

managed to successfully bond with tigers. In terms of control and contact, the human-tiger relationship in the twenty-first century is drastically different from previous generations. Tiger trainers, zookeepers, rehabilitators, and workers in big-cat sanctuaries can all testify to the attachment that can exist between humans and tigers. Cubs are impressionable and easily tamed. The story of Arjan Singh and his “Tara” is perhaps the earliest known example of a human who loved his tiger friend enough to set him free.

Conservationist “Billy” Arjan Singh devoted sixty years of his life to conserving Indian wildlife between the mid-late nineteenth centuries. In much the same tradition of Jim Corbett and Kailash Sankhala, Singh traded his love of hunting tigers for a love of saving and protecting them. Around the age of 30, he combined his love of farming with his devotion to wildlife conservation and created the *Tiger Haven* sanctuary, a place where “the line between wild and tame, man and animal, has always been blurred.”²²⁶ Geoffrey C. Ward described Billy’s reaction to encountering a male tiger sprawled across a riverbank at *Tiger Haven*:

I stole a look at Billy as he watched the tiger...Head cocked to one side, smiling, he was rapt, adoring, his face lit up as if he had unexpectedly come upon his lover. The tiger gazed back for some time, then rose slowly to his feet and...slipped into the underbrush and disappeared. Under Billy’s vigilant eye, this tiger, at least, still occupies his range, still reminds us of what will be lost...²²⁷

Singh had a special relationship with a tiger cub named Tara whom he raised at *Tiger Haven*. She was kept unchained and was largely free to wander the limits of the property. Once Tara had grown to adult size, Singh decided to send her to live in a nearby reserve, Dudwa

²²⁶ Ward and Ward, *Tiger Wallahs*, 75, 2000.

²²⁷ Thapar, *Battling for Survival*, 328, 2003.

National Park.²²⁸ This reintroduction of a captive-born tiger was successful in several ways, but the experience highlighted problems that Singh anticipated early on. Reports of a tigress coming too close to people's farms began to spread, and a few people were killed. Though several tigresses were killed and brought to him for identification, Singh continued that she was innocent of the man-eating charges.

Reintroducing a captive-born tiger into the wild can be extremely dangerous to both human and tiger because of the tiger's increased acclimation to humans. According to the principles of Singh and the Tiger SSP, however, the wild tiger's survival is utterly dependant upon strategies that augment and support wild tiger populations.

Reintroduction – plans to rewild and replenish

Within the last century, science has realized the value of protecting interdependent natural systems for the sake of the wild tiger. Reintroduction describes the process of “releasing individuals of a species into an area formerly inhabited by the species,” in order to augment species with dangerously low populations.²²⁹ The primary objective of reintroduction should be the reestablishment of a species and every effort should be made to avoid introducing additional stress. Ideally, the reintroduced individuals should require minimal long-term management. The World Conservation Union (IUCN) and Species Survival Commission (SSC) published policy guidelines for reintroductions in 1995. As reintroductions increased worldwide, it was apparent that policies were needed to ensure that the projects met their intended conservation benefit, and to minimize adverse impacts.

²²⁸ Singh, *Tiger Haven*, 1973.

²²⁹ Chris Wemmer and Mel Sunquist, “Felid Reintroductions: Economic and Energetic Considerations,” in H. Freeman, Ed., *Proceedings of the 5th International Snow Leopard Symposium* (193-205), 1988.

In the scientific realm, *reintroduction* differs fundamentally from *introduction*. Introduction involves placing an agent into an environment where it has not previously been habituated. *Reintroduction*, on the other hand, is the act of placing an individual into an area in which members of that species have already assimilated. The newly introduced individual has not been in that habitat, but the ecosystem is primed to receive them.

Given all that we now know about the tiger species, it is easy to imagine them to be an ideal candidate for reintroduction to the wild, even when they have been raised in captivity. All species of cats bear similar traits, such as hunting and stalking prey. However, there is a crucial difference between sport hunting and survival hunting, and the line between surviving and starving is thin even for a wild-born tiger. And although tigers are among the more resilient mammals, the stresses of human interference are seriously compromising their ability to manage their own numbers.

Humans have well established that they know how to effectively control and alter tiger populations. Repairing these alterations is infinitely more complex and uncertain an undertaking, unfortunately, than creating damage. Tiger reintroduction has only been attempted a few times. The story of Tara is the most well-known of these. It is not, therefore, a completely understood science as much as an experimental procedure. Nonetheless, captive breeding and reintroduction are generally met with enthusiasm from the public. This is partly because of the blind faith that many place in science, and partly because it encourages hope and confidence in our abilities to repair ecological damage.²³⁰ This ideal is often expressed through media. For example, several popular movies depict the last-minute aversion of the Earth's total destruction, thanks to science and technology. Similarly, as tigers face elimination, science must now step in and avert danger.

²³⁰ Wemmer & Sunquist, "Felid Reintroductions," 1988.

Reintroducing a large carnivore into a human-dominated environment requires complex planning and collaborative efforts. Variable teams of experts from multiple disciplines are required for successful reintroduction potential. These include people from governmental natural resource management agencies, non-governmental organizations, universities, veterinary institutions, animal breeders, and zoos. Reintroduction calls for changes in cultural boundaries and forges reinstatement of natural ones. Every possible influence that might inspire changes in the individual marked for reintroduction must be considered. Plans should also try to ascertain all potential impacts on the natural habitat and human culture.

Preparation for the introduction must ensure that the individual possesses the skills required for survival under the conditions that exist. These efforts hinge upon the assumption that even captive-born tigers can learn relatively easily to employ survival skills. This has been the case so far; impressionable tiger cubs seem to grasp each lesson instinctively. The next step will be to ensure that each lesson is ingrained into their behavioral tendencies. Trainers should provide the cubs with ample opportunities to reinforce these essential skills. Training should endeavor to offer the individuality a survival probability that matches that of their wild counterparts.

The taxonomic status of every reintroduced individual should be assessed. Molecular genetic studies help to ensure exact taxonomy. Investigation into losses and the fate of individuals after placement should be carried out. Detailed studies of status and biology of wild populations enable determination of the specie's critical needs. These include habitat preferences, intraspecific variation, adaptations to local ecological conditions, social behavior, group composition, home range size, shelter and food

requirements, foraging and feeding behavior, predators, diseases, and an overall knowledge of the natural history of the species. The appropriate number of individuals for each habitat should be determined, as well as the estimated length of time for re-establishment. All previous reintroduction attempts of the species and within the intended area should be researched and contact made with experienced experts. A habitat restoration program should always precede the reintroduction attempt. The intended site should be within the specie's historic range.

Reintroductions require the long term commitment of all participants and major financial, political, and public support. Prevalent attitudes of local populations are a certain determinant to the success of the project. The tiger's plight is blamed on and continues to be both directly and indirectly impacted by, the actions of humans. Locals should be encouraged to understand, accept, support, and if possible, participate in conservation efforts. If this support is not possible, plans should be abandoned and a more appropriate venue sought.

Removal of individuals for reintroduction should never endanger the captive stock population nor should placement jeopardize the wild source population. Captive individuals must come from a collection that has been tightly managed demographically and genetically and in accordance with the standards of contemporary conservation biology. If reintroduced tigers seriously threaten the lives, property, livestock, or pets of locals, backup plans should exist and be malleable to each situation. Plans could include additional rehabilitation or relocation. Destruction of the offender or suspected offender should only be considered as a last resort.

The South China Tiger²³¹ (*Panthera tigris amoyensis*) is believed to be the ancestor of all tiger subspecies – the most ancient genetic lineage. Unfortunately, it is the most critically endangered subspecies at present. The subspecies is not officially listed as Critically Endangered/D with a high probability of becoming extinct within the next two generations. Although it is not known exactly how many tigers are left in the wild, most sources approximate them to number between zero and thirty. A census in 1987 and another 1990 produced evidence of tiger life, but no actual sightings, and since then fewer evidence has materialized. The South China tiger is considered by many to be already functionally extinct. Close to sixty tigers currently live in China’s zoos. All of these are descendents of six tigers that were captured in 1956. Inbreeding has been a large contributor to the near-demise of this subspecies.²³²

*Save China’s Tigers*²³³ was the unlikely brainchild of former-fashion-mogul-turned-housewife Li Quan. She answered her call to conserve wildlife by establishing the fund, whose stated mission is to “protect and restore ecosystems through saving the flagship Chinese tiger and other big cats.”²³⁴ Critics have called the project futile and dangerous, and have attacked Li Quan personally with scathing mockery. She dismisses it all as inevitable mud-slinging in a situation concerning “the most political of all animals.”²³⁵ The project is undoubtedly daring, and unprecedented. There is no evidence to guarantee its success, but results so far have been encouraging.

²³¹ The South China tiger is also known as the Xiamen or Amoy tiger.

²³² www.savechinastigers.org; Singh, *Vanishing Tiger*, 2003.

²³³ *Save China’s Tigers* was founded in 2000.

²³⁴ www.savechinastigers.org; 2005.

²³⁵ *Ibid.*

In the last twentieth-century, the Chinese Government started its elaborate collaborations effort *Save China's Tigers* towards implementing a plan to try to save the nation's tigers. China's State Forestry Administration had led the effort since 1990. On November 26, 2002 *Save China's Tigers* entered into an agreement with the Wildlife Research Centre of the State Forestry Administration of China and the Chinese Tigers Trust of South Africa. Per conditions of the agreement, a Chinese Conservation model was written to accompany a specially constructed Pilot Reserve in China. The model is outlined in a paper written by Li Quan.²³⁶ The rehabilitation part of the project will occur in conjunction with an on-going Meihuashan Chinese Tiger Rehabilitation venture in Fujian, China.

The project is unprecedented in terms of innovativeness. This is the first time in history that an effort of this scale has been attempted on a large cat. Much care has been given to considering every environmental and cultural connection. While the cubs are busy training, their intended Pilot Reserve has undergone renovations in preparation for the reintroduction. The habitat must be surveyed, restored, and adequately populated with prey, as well as other predators. Indigenous wildlife will accompany the newly placed cubs in their new habitat. Avenues for eco-tourism will work to boost the local economy. Coordinated outreach has garnered a world-wide network of volunteers who handle research, fund-raising, translations, and other essential tasks. The project is ambitious, yet the premise is simple. Selected Chinese cubs are taken from their captive environments and sent to South Africa. There they will spend some time – as long as it takes, being

²³⁶ Li Quan, "Creating a Chinese Tiger Conservation Model – On the Chinese Tiger Reintroduction Project," 2000.

introduced to the hunt by exposure to prey animals in a designated area of 300 square miles.

Once the cubs demonstrate that they can hunt to meet their own survival needs, they will return to a Pilot Reserve in China. The process is not complete at that point, however. It will take several generations before they are fully rewilded; several generations of cubs raised by mothers who have never had their meat delivered to them by a human. The rewilding process cannot, however, erase the potential for human-tiger conflict. History is full of stories of conflict and it would be unrealistic to expect human-predator harmony. Yet there are important lessons to glean from historical friendships between humans and tigers. Singh's experience with Tara reveals several of the problems inherent in reintroducing a captive-born tiger into the wild. The process of rewilding tiger cubs is a modern-day attempt to deal with these problems.

Rewilding the tiger – process and progress

The notion of “rewilding” promotes re-conceptualizing our common notions of “wild.” What does the process of rewilding a tiger entail exactly? Does this imply that the “wild” was somehow lost, or taken, and must now be replaced? *Can* wildness be reinstated? What qualifies us to reinstate the wild in anything, especially something that we have historically been at odds with, largely due to our inability to tame it? Why would we *want* to undertake such a complex project? Is rewilding training an adequate substitution for the training wild tiger cubs normally receive from their mothers?

Tiger reintroduction is a subject of much controversy. Critics point out that captive tigers may possess enough instinct, but lack in the skill department. There is no

definitive answer to the debate over whether a tiger learns all of its survival ability from watching its mother or whether the ability is hard-wired and can thus be remembered.

Environmental writer Cory J. Meacham brought up a popular challenge to the premise of the South China project:

If tigers can be reintroduced, one argument goes, then why continue throwing good money after bad in a struggle to save what many believe is already a defeated species? Why not cut losses now and regroup for the future...since the South China tiger is clearly lost in the short run, why not just bank its gametes for use in a possible reintroduction in the future and redirect its current conservation funding to a subspecies with greater hope of sustained survival.²³⁷

Valmik Thapar left no question about his stance in opposition to reintroduction by stating directly:

not in the wild. Totally out. The captive tiger is a dog. You put it in the forest, a spotted deer will kill it. And our biggest problem in India is the man-tiger conflict in terms of livestock. Each of our tiger reserves is already plagued with cattle lifting. These are wild tigers. You put in a captive-bred animal, however much training you may have given it...and the chances of that tiger finally going back to man to kill are too high for this country or any park director to consider.²³⁸

Some of the questions posited above are highly subjective. No easy answers exist. Rather than attempt to postulate answers to every one of them, this researcher encourages the reader to consider them in terms of the urgency of the tiger's crisis. South China's rewilding project is the first one of its kind to take on conservation of a large predator. The fact of its existence speaks of the enormity of perceptual changes in the

²³⁷ Meacham, *How the Tiger Lost its Stripes*, 23, 1997.

²³⁸ Valmik Thapar, *The Tiger's Destiny*, London: Kyle Cathie, 49, 1993.

human outlook and hierarchy of priorities since Jim Corbett first became concerned for the plight of the tiger in the nineteenth-century.

What follows is an overview of the rewilding project. A daily synopsis can be found by clicking on the appropriate link on the website (www.savechinastigers.org). The online journal traces the cubs' daily and weekly status as trainers work to teach them how to fend for themselves. Cathay and Hope were the first cubs chosen for participation in this project. They were born, respectively, on January 21st and February 17th, 2003, at the Shanghai Zoo. They were sent off on their journey to South Africa on September 1, 2003 amidst much fanfare and media coverage. After a period of quarantine and recovery from the long flight, their training began around week 6.

The cub's presence on South African soil was celebrated; this was the first visit from South China tigers. They began their training healthy, playful, and with hearty appetites. Before they could be trained to kill their food, they had to learn to appreciate meat. They were a little reluctant to eat it first, but after repeated exposure they got the hang of that part completely. One day a sparrow flew around their enclosure. They chased it instantly, but it got away.

On October 1st, the cubs were given a live rabbit. It was soon obvious to the researching team that, although they chased and bit at it, they had no idea how to hunt it properly or deliver the killing bite to the neck. After playing with it into the next day, it was removed and re-introduced as food. Disinterested, they ate their prepared chicken and beef dinner. Later, in November, their reactions were a bit quicker when presented with a live rabbit. They went straight for the neck and killed it quickly. They ate their first live

chicken that week, as well. By week 14 the cubs were subsisting on mostly live meat with other food supplementing the new diet.

The following is an excerpt from early November, 2004. This is an example of one of the training sessions. The process of training itself has only a few basic elements. They are: setting and props. The cubs did not always know that they were supposed to kill the prey animals that the trainers introduced. At first, they mainly wanted to play with the food, but signs to encourage the trainers happened from fairly early on, as this quote from the online training journal highlights.

After they play with the first chicken for half an hour the chicken seems tired and lies still. This is when the cubs become interested again. Cathay took the chicken next to the water tank, embracing it with her paws and licking the feathers. Hope stands beside her looking as though he wants to take a turn, Cathay was insistent that this was her kill and snarled at Hope as if to warn him to stay away. The keepers Tan Jun and Dylan quickly released the second chicken into the enclosure for Hope but Cathay charged over and within a few minutes the second chicken was dead. Once both birds were dead the cubs walked towards to door and looked at the keepers as if the chickens were for fun and now where is their real food. The keepers were to start with very disappointed. Cathay and Hope gave up waiting for food and went to play with the dead chickens. It was with great joy that our keepers witnessed Cathay tearing away the now dead chicken with her teeth and paws and opened up its breast with two bites and started eating the chicken's internal organs and legs!! She spitted out the chicken feather! After a short 10 minutes, only the chicken head remained. Hope was carefully eating the meat of the other chicken beside Cathay, full of appetite! The cub's confidence and techniques they employ are already leagues ahead of where they started a month ago. We are

confident that they are daily acquiring the life skills tigers need in order to hunt successfully in a natural system.²³⁹

Eventually, the cub's instincts began to catch up with their inexperience. Over time, they were offered prey animals that got successively larger, and they grew more adept at stalking and killing the larger prey. Gradually, less of their diet consisted of food prepared by humans. The timeline of the journal is full of successes, large and small, that are indicative that the project will succeed in meeting its goal of readying the cubs for life apart from human-provided subsistence.

In mid-March, 2005, Cathay and Hope were radio-collared and entered an important phase of their training. Local as well as international media showed up to document their transference into a bigger and more remote training area. It did not take them long to successfully hunt despite their increased independence from their trainers. Encouraged by the cubs' adaptability to new circumstances, their trainers decided that rehabilitation was a more suitable name for the project at this stage than rewilding. Quoting a passage from the journal summary of the period between 7-10 April, 2005, "That is what it is of course, rehabilitating an animal born in a zoo into an animal that can kill for itself, and function without human intervention."²⁴⁰

As April, 2005, nears its end, the project enters its 87th week and Cathay and Hope have made significant progress in their training. They are now hunting all of their food, and are doing it on a nocturnal schedule. Many times the trainers cannot easily find their carcasses. They are exhibiting secretive tiger behavior – an extremely important trait

²³⁹ Web address of South China rewilding training journal for this particular entry:
<http://www.savechinastigers.net/articles.php?id=294>.

²⁴⁰ [http://www.savechinastigers.net/articles.php?deb=0&cat=SART+day2day&ordre=&par=.](http://www.savechinastigers.net/articles.php?deb=0&cat=SART+day2day&ordre=&par=)

in the life of a predator. They are highly skilled now at locating animals to eat – and are learning which ones to avoid. The last week of the training so far finds Cathay with only two quills in her from an altercation with a porcupine. Plans are now underway for a second of pair of cubs to follow in Cathay and Hope’s footsteps at the rewilding camp in South Africa. Chapter six examines the project within the cultural and social atmosphere that is so crucial to its success.

South China tiger in culture and myth

It is easy for humans to idealize animals who do not threaten them in any way. Humans living far from the living wild tiger tend to venerate the tiger’s body and spirit. Those living in closer proximity to the tiger revere the tiger, as well. The tiger is perceived by many people as a magnificent, living symbol of the timeless nature of wildlife, an icon for a wild tradition that we long so desperately to conserve. Veneration of the tiger is just one strand of the history of humans-tiger historical paradoxes. People living within Asian societies, on the whole, value their tiger. However, human societies, cultures, and values are not static; they continue to change. Traditional Udegai people once lived in the east of Russia as tiger-worshippers. But their culture today hardly resembles this period.²⁴¹

Animism is the belief system supporting the notion that spiritual life embodies all beings, including animals, plants, and celestial bodies. In accordance with this belief, people in areas across Southeast Asia and the islands rarely hunt, even though they possess weaponry. Long ago, the tiger, referred to as “the striped one” was simultaneously feared

²⁴¹ Seidensticker *et al*, *Riding the Tiger*, 1999.

and worshipped.²⁴² Some villages believed that the striped one would only kill villagers guilty of breaking taboos. They soon learned not to trust the wild nature of the tiger. Regret formed the basis for a group chant around the head of one tiger killed for slaughtering twenty-four villagers in northern Burma, and the tiger's spirit was sent off in peace.²⁴³ Fanfare of this type is only true for a small portion of human dwellings near tiger territories and is not as prevalent in today's society.

The tiger has always been one of the strongest and most well-known symbols of Chinese culture. Revere, fear, respect, and awe: all of these words have been demonstrated countless times throughout China, all of Asia, and the world in reference to the live tiger. In the Chinese Zodiac, the tiger is the third sign. People born under this sign wear the badge proudly. Because their birth occurred under the symbol of such magnificence, they know that the qualities of courage, tolerance, generosity, optimism, and long life are their birthright. Traditionally, tiger represents the *yang*, or is associated with stereotypical male characteristics such as bravery and rigor. In Chinese folklore, the tiger is known as king of its habitat and is believed to dispel evil and misfortune ranging from the common to the supernatural. In ancient times, the protection of the tiger helped to keep the Drought Demon at bay from plots of architecture.

There are literally hundreds, or more, examples of the importance of the tiger in Chinese history, culture, and mythology. Irony is obviously rampant when we compare the genuine and lasting power of the tiger form on the human psyche with treatment of actual tiger bodies. An earlier chapter brought up the point at which our imaginations allow us access to the tiger in a way utterly distinct from the tiger in the woods. Many theories

²⁴² Matthiessen, *Tigers in the Snow*, 65, 2000.

²⁴³ Matthiessen, *Tigers in the Snow*, 2000.

support the notion that we express our feelings about the tiger through many different creative outlets. We deal with our increasing metaphysical alienation from nature with creative instruments to replace that lost connection that John Berger spoke so eloquently of in his piece about the true price of zoos.

In the midst of centuries of intellectual applications of the tiger to the mythological and spiritual realm, the real tiger gasps under the weight of our increasing control. We turn now to an extremely crucial reason for saving tigers. Biodiversity is not a human matter, or an individual species matter, but one that concerns the enormous importance of each cog in the wheel of all life.

Chinese Tiger Campaign

The Chinese Tiger Campaign is based on the summation of claims that South China is making to explain their dramatic effort to save their tiger from extinction. This campaign is constructed out of a three-tiered model comprised of three facets of the tiger's significance within Chinese culture.²⁴⁴ The first, Spiritual Tiger, represents the spiritual feelings that the tiger elicits in those fascinated with its ancient spirit and timeless beauty. Cultural Tiger embodies the historical strength of the tiger as a cultural icon and symbol. Ecological Tiger, or Environmental Tiger, is the manifestation of the tiger as an umbrella species within its ecosystem. The three components of the Chinese Tiger Campaign should be reminiscent by now to the overarching themes that delineate the human-tiger shared history. These are all manifestations of our tendency to act in accordance with the ideals of biophilia. This model translates easily into any conservation approach, and all of the countries harboring tigers could use it to strengthen their own plans.

²⁴⁴ www.savechinastigers.org

Human encroachment into tiger territory has undoubtedly harmed the tiger species, but it is also harming us. This facet of the campaign reminds us that our nature deteriorates along with that of the tiger – because we sprang from the same natural source. This campaign uses this unique three-pronged approach to demonstrate the dedicated quality of their work. The combination of these three ideals is a culmination of a past and present reality containing the tiger, with the fervent dedication to preserving the tiger for future generations to know and revere.²⁴⁵ The rewilding project is a dramatic and last-ditch effort to use the current human-tiger relationship as a channel to foster a tiger with traits resembling those from the past.

Rebirth through rewilding, rehabilitating, and repopulating

“When a man wants to murder a tiger he calls it sport; when a tiger wants to murder him, he calls it ferocity.” – George Bernard Shaw

Not surprisingly, tigers today are most plentiful in areas that are the most remote to human expansion. When Corbett declared his alarming estimate of only 2,000 wild tigers left, it was clear to him that the situation was critical enough to necessitate an act of government to exert protection management involving the cooperation of local people.²⁴⁶ It is becoming increasingly clear that the success of negotiations between involved participants must consider all facets of the problem. In other words, any proposed solutions must encompass efforts to meet the needs of tigers *and* humans.

²⁴⁵ www.savechinastigers.org.

²⁴⁶ Schaller, *The Deer and the Tiger*, 1967.

As twenty-first century conservation efforts work to maintain tiger habitat and populations, examination of past events and recent ecological studies should be combined to aid in our understanding of cultural and social influence. Mahesh Rangarajan works with the Ranthambhore Foundation.²⁴⁷ He believes that careful analysis of certain milestones in history, however crude, can provide insight into the future. This is consistent with the logic behind much conservation work today; if we place our focus on the appropriate milestones, we may better equip ourselves to make choices for long-term sustainability.

Commitment to a dedicated and thorough examination of all of the issues should enable us to develop the means to restore reserves and do what is necessary to avoid compromising wild tiger's ability to sustain their populations naturally. Tiger conservation is an ecologically complex problem and while plans are drawn up, existing populations are fading into oblivion fast. The forces that still interrupt the tiger's natural life habits are great, even in reserves where their protection is supposed to be key. Successful conservation gains may be possible with communication and cooperation between government, scientists and field-study workers, conservationists, zookeepers, Asian locals, and worldwide consumers.

It will be important for us to educate locals living near reserves in how to best protect themselves from harm if they encounter a tiger. An approach that is used in the Sundarbans is the wearing of a facemask on the back of the head. Many believe that the tiger will not attack a man if he can see his face, that his inherent fear takes over and forces him to flee. Towards the end of the 1990s, villagers in the Sundarbans were trying a different approach to thwart tiger attack, using modern technology. Dummies, dressed in

²⁴⁷ The Ranthambhore Foundation was created in 1988.

used human clothing and drenched in urine, were set up as decoys. Once the tiger went to attack the dummy, they would be shocked by electric currents wired to the body. The larger hope was to train tigers to avoid humans by giving them a negative association.²⁴⁸

The reintroduction of tigers into Asian reserves raises moral and ethical issues. Many paradoxes are present in historical relations between humans and tigers. Despite alterations in tiger habitat, behavior, and even with full knowledge of their potential extinction, tigers are more culturally affluent than ever. Much like the salmon in Richard White's study of the Columbia River, tigers are truly "repositories of meaning."²⁴⁹ Is it ethical to place tigers into an environment where it is likely that humans will kill them? Is this danger somehow different than that posed by the unpredictability of their survival? At what point in the process do we cease being responsible for their safety? Conversely, is it ethical to potentially endanger local humans in order to encourage the tiger populations to grow?

These questions are difficult, if not impossible to answer. The issues they represent are highly controversial. It is probably safe to say that nobody wants the tiger species to vanish. Most humans have some type of interest, even if only in passing, in tiger conservation. Tigers are valued the world over for their beauty and strength and for the ways that they enchant and arrest our fascination (as is evidenced through countless books full of pictures of the animal). Human culture glorifies the tiger's image, which appears brilliantly on everything from clothing, calendars, and stationary to blankets and billboards. Poets speak of the tiger's strength, grace, and beauty, and people the world over lament the

²⁴⁸ Jackson, *Endangered Specie*, 1991; See also Alderton, *Wild Cats*, 16, 1993.

²⁴⁹ Richard White, *The Organic Machine: The Remaking of the Columbia River*, New York: Hill and Wang, 90, 1995.

tragedy unfolding before their eyes. Many people idolize the great cat's magnificent form. Poets draw inspiration from the tiger's strength and grace and writers spin tiger-centered tales of myth, mystery, and fable. Artists capture its form in paintings and sculptures.

Even poachers and people involved in either supplying or purchasing medicines made from tigers parts place value on the tiger to an extent that would be jeopardized if they no longer existed. If tigers were gone completely from the jungles, poachers would not stand to turn profits selling their skins and body parts. The dilemma from the perspectives of those whose sole interest is commodification, the outlook is focused on short-term gain rather than long-term preservation. Likewise, the needs of tigers live in the short-term, consequently overriding all else. Relations between humans and tigers, overall, remain at volatile standstill, although humans have undoubtedly incurred losses, it is abundantly clear which species has been hit the hardest.

Unlike many situations where problematic animals can be classified as pests and driven out of an area or exterminated, tigers are protected under human-created law. Many organizations work diligently on their behalf, and efforts to save the remaining five tiger subspecies are at the top of the conservation priority list. Our response to conflict must then involve evaluation techniques aimed at collecting information with which to prevent future conflicts, and enhance conservation efforts. Any degree of successful tiger conservation will require both large-scale, joint efforts of all of the following: zoo management, scientists, conservationists, government, law enforcement, local Asian communities, and worldwide consumers.

Personal and societal values are evident in how wild tigers are perceived and treated. Conservation values are deeply integrated into our consciousness and behavior but

are also adaptable to changing cultural circumstances. The problems that hinder human and tiger co-existence can only be addressed through active participation crossing disciplines and connecting social, economic, political, and scientific spheres. Human beings have demonstrated repeatedly their tendency to dominate, control, and in many cases eradicate large predators.

Tigers in the wild are in real trouble. Wild tiger populations are disappearing at rates that have arrested the attention of the world. Centuries of human expansion has damaged the forests – the tiger’s only natural home – and affected the prey populations upon which they depend. Our terribly urgent mission at present should be to do what is necessary to ensure that wild tiger’s can replenish their numbers in Asian reserves. We should do what is necessary even though it will mean modifying our own actions, and working hard for something that does not directly benefit humans. If they cannot sustain their numbers in reserves, the wild tiger will be no more. As we work to this end, it is important that we consider that human-tiger co-existence encompasses *all* contact, including conflict. Armed with the knowledge of the tiger’s ecological worth, we can now only learn from the lessons of the past, and take measures as necessary to prevent future conflict. There is no time like the critical present to own up to our actions, try not to repeat past mistakes, learn from present ones, and work to establish viable and lasting solutions.

Groups raising funds for tiger conservation assure their members that by pooling efforts to slow poaching and forest destruction, we may spare the tiger for another generation. Do the tiger’s feel this shift in vitality? Can they, on some level, sense the urgency of those who work against all ecological, biological, cultural, and economic odds to protect them from those whose view is still focused on the trees, rather than the thinning

of the forest? When a species dwindles to the point at which every individual's survival matters, things are indeed grim. Yet as long as humans pay attention to their biophilic concerns and work to correlate the wild in nature with the nature within their minds, hope can grow. Conservation groups tap into a widespread sentimentalism for the nature ideal within our collective psyche.

Armed with our knowledge of tiger behavior and ecology, we can make collectively intelligent and informed decisions. In doing so we may prevent regrettable and fatal interactions from occurring. Humans *can* and *must* claim moral responsibility for the consequences of their actions, take the initiative, and design scenarios for sustainable co-existence. As top predator of their ecosystem, tigers possess ecological value, the extent of which we are still not yet fully aware. The true tragedy lies in our responsibility for the near eradication of a top predator if we have the means to prevent it. Cooperation between governments, scientists, zookeepers, conservationists, and local villagers is vital for successful tiger conservation. The future survival of the tiger depends very much on comprehensive and multi-faceted strategies, which proactively deal with habitat encroachment, prey base decline, and poaching for international trade.

High priority populations should be identified with the intent of reversing the population decline. Enforcement of protection laws is necessary and should encourage the support of local human populations. Personal security, values, and ideals all factor into how readily humans can alter their uses of animals. It is very important to convince consumers worldwide not to use tiger products, and to provide acceptable alternatives. Regular scientific monitoring of status' and populations are crucial, and efforts should unite

the local political sphere and publics of countries with tigers, and consumer nations around the world.

Historians are generally reluctant to speculate on the possibilities of possible pasts. However, had the human not driven the tiger out of the forest and into his own camp, the tiger would still rule the forests, humans would not suffer human and livestock loss to the struggling tiger, and we would not now wage war against our own ideals. It seems logical to question what truly motivates us to conserve this large animal that, when free to roam, easily dominates our sense of security. Do we honestly want to re-establish and preserve the “wild” within the tiger? Have we unwittingly socialized the species to an extent where that is impossible?

CONCLUSIONS

Science and advocacy debates

While many of us consider ourselves supporters of the tiger conservation cause, not all of us can truly have the time, talents, and expense required to be an active advocate.

Advocacy is a volatile topic in the current century. The role of science has long been to study, understand, duplicate, and manipulate natural earthly processes. While complete objectivity is not realistic, some degree of impartiality remains a laudable goal for researchers and scientists. Peter Matthiessen's notable *Tigers in the Snow* (2000) wisely emphasizes that if the work of seminal tiger biologists is to have a measurable impact on future conservation efforts, and biodiversity preservation, they must augment advocacy and public education. Do values belong in the scientific sphere? Let us rephrase that question to fit the tiger conservation problem. Can scientists devise solutions to suit the needs of both humans and tigers without incorporating values? Should scientists be advocates for conservation efforts?

This thesis would argue that objectivity is largely irrelevant and that scientists not only can but should be advocates for causes they believe in. Their knowledge and motivation should be a welcome impetus for tiger conservation efforts. Although the role of advocacy within science and conservation biology has been challenged in a number of arenas, the fact that it has been the subject of serious debate alludes to its importance. An additional area of contention centers on debates over people living in or having access to national parks. It is often difficult to decide when or whether expert environmental advocacy outweighs locally based scientific knowledge.

The South China rewilding project is attempting to reestablish survival skills in tiger cubs in the hopes that the reserves can regain their tiger populations. This is no small feat, and will require intensive planning if it is to succeed. Legal protection and expert advice is crucial, but local Asian communities need incentives that matter to them. Tigers and people in China compete for the same resources: land, water, and prey animals. Unlike the governments of the nineteenth-century, however, today's governments are cooperating with non-governmental organizations, and conservation groups to develop local community cohesion and support. To this end, developing alternative resources and providing compensation for tiger damage are important, as are education and opportunities for participation in tiger conservation projects.

Humans and tigers have battled one another for a long time even as the forests around them fell away. No matter what our best laid plans may contain, there is no turning back. Tigers are important to the planet, and within their ecosystem, and they are important to us. Our rampant intolerance of forests full of tigers has given way to study, occurring concurrently with control. The forests of today are smaller and more managed than they were in centuries past, but they still contain all the elements necessary for harboring wild tigers – if we allow their numbers to replenish themselves. Centuries of altercation and admiration has led us to now – a time of teaching and cooperating. If we stop the trend of subspecies loss in time, we may yet reconcile the three tigers – alpha, biological, and mythical – in the forests and in our minds.

Ruby's legacy

It is only appropriate to bring this thesis to a close by relaying my personal investment in tigers. Like most people in the world, my contact with tigers has been strictly limited to visits to zoos, wildlife specials, journals, and books. In the past few years, I have had two very unique experiences through which I was granted intimacy with two tigers. I came across the first entirely by accident. Wandering past booths at the annual fair in Roanoke on a summer day in 2003, one caught my eye and attention more than any of the others. A group was tucked between two unrelated exhibits with tiger cubs and cobras.

Anyone could get their picture taken (Polaroid) with the tiger, or cobra – for a fee, of course. They weren't attracting a huge crowd – very few that I saw. It seemed that people who did stop were either very interested or very adamant about *not* going near the animals. I, of course, took advantage of the opportunity – twice. The first time, I walked away with a Polaroid image and a smile. The second time, I returned armed with my camera. I sat on the seat, my lap covered with a towel. My then 9-month old daughter sat on one side of my lap, the tiger cub, only about 8-weeks old, sprawled across the rest. It drank from the bottle I held as I stroked its soft, downy fur and tried to memorize every detail of the moment. The experience was made even greater when I was permitted to perform my own photo-shoot of the cub. I took many wonderful close-up shots of the cub as it paced and rubbed its head against mine in a manner completely comparable to the affection of the domesticated cats in my home.

The second tiger experience from my personal collection of memories occurred while conducting research. Mill Mountain Zoo's resident tiger, and conservation mascot, is Ruby. She needs no formal introduction to the inhabitants of Roanoke and the New River

Valley. Here, Ruby alone reigns as jewel of Mill Mountain. Ruby is a 17-year old Siberian tiger. Her home is at the Mill Mountain Zoo in Roanoke, Virginia. Her history is not unusual. She is living proof of the power that a tiger within our midst exerts over us. Ruby was confiscated from the wilds of Siberia in 1988 and raised as a pet by a woman in West Virginia. Within two-years, local authorities became aware of her situation. She was sent to the zoo under what was intended to be a temporary arrangement while authorities found appropriate tiger lodgings. Before too long, this close-knit mountain community had bonded to their newest mascot of the wild. Local businesses donated enough resources to build her a natural and comfortable home on a stretch of land. Because she did not come with papers, she could not be bred. Zoos only breed tigers that they can certifiably prove are pure bred.

Ruby's exhibit is located towards the far end of the zoo, but none fail to visit it. She has many natural comforts in her habitat and keepers continually create enrichment exercises to keep her mind, body, and spirit active. Her contact to the earth is testament to 21st-century ideals. She has space for roaming and water for dipping. Her many fans can observe her from a specially built deck, or walk alongside her fence to catch her drinking, wandering her territory, or stretched out on her back in her most inviting posture. Her exhibit, the product of Carl Hagenbeck's influence in the late nineteenth-century, seems a success by all accounts.

I have watched Ruby on many different occasions over the past five-years and have spoken with members of the zoo's dedicated staff. She is obviously very important to them both personally and professionally. Ruby is given top-quality medical care. Arrangements exist to make sure that Ruby's needs continue to be met, even during emergency evacuation procedures. She is routinely placed into her "squeeze cage" with food

as bait/reward so that she will remain comfortable; she is also weighed in this cage. In the event of fire or the danger on Mill Mountain, she would be transported in this cage on wheels.

At times, it seems as though Ruby has shaken off all connection to the Siberian jungle where she came into the world. She exhibits signs of her kinship with humans frequently – chaffing in response to the human voice and rubbing her head and side on nearby surfaces when people, particularly those she is familiar with, come near. These actions signify trust and affection in felines. The zoo management and staff know better, however, than to assume that Ruby has lost her wild edge completely. They know that she is innately wild and could reveal her dangerous side with little or no provocation.

Even better than researching the tiger on paper is seeing one up close and personal. That was my consolation prize on my final research trip to Mill Mountain Zoo. I arrived late and found the conservation coordinator tied up in meetings for the rest of the day. They appointed a keeper to take me around to the back of Ruby's area. When we arrived, she was having her afternoon nap. The keeper coaxed her to come closer, encouraged her to try to be more active. I did not mind; I certainly do not need a show. Her presence is thrilling enough! Ruby chaffed at us from her spot a few times and blinked her eyes lazily.

Then she stood up slowly, turned around and presented her side and rump for me to photograph. She settled back down, this time facing us. I snapped her picture from every angle my positioning allowed. I gazed at her for a while, admiring her markings, tigerness, and ethereal forest spirit. I thought about the conceptual history leading to the current possibility of losing her species in the wild. I pondered the meaning of her long legacy. I tried to imagine colonial hunters killing so many of these gorgeous animals. I tried to

imagine encountering her with no barriers between us, and found it difficult to really imagine encounter devoid of her familiarity and trust of humans borne of her lifelong association with them. Soon, I told her, I would be back, adding that I appreciated her very much. She blinked at me and crinkled her face. Leaning into her massive shoulder, her posture indicated nothing more than a cat on the verge of succumbing to an afternoon nap.

As I watched Ruby's timeless form, I thought about my daughter Quinlan's great-great-grandchildren. In their lifetime, will books and journals still talk of nothing but endangered animals, dwindling forests, damaged ecology, and uncontrolled poaching, or will these things be a figment of history by then. Will any animals deemed useless or a pest to humans remain? Will children learn in school about how there used to be forests with animals in them? Will the children find this as difficult to envision, as prehistory seems to me?

Despite everything written above, I was recently shocked by something that I read. As the website for *Save the Tigers*²⁵⁰ opened on my browser, a message popped up declaring that "Scientists estimate that by 2010, wild tigers will be extinct. PLEASE HELP SAVE THE TIGERS." Cory J. Meacham, for one, makes the point in his book addressing the endangerment of the tiger that it is not the tiger that is going extinct, but the *wild* tiger. To some, there is little difference. For a growing number of people, myself included, the difference is not just huge; it is everything. The rewilding project of South China is innovative, ambitious, and just may work. However, it is only part of the answer.

People whose actions threaten the current populations need to be involved, consumers involved in keeping the tiger part trade alive worldwide need to be involved, and people living in proximity to tigers need to be involved. If the South China tiger can

²⁵⁰ <http://www.geocities.com/rainforest/canopy/7897/tiger.html>; viewed on 3 May 05.

be rewilded, perhaps the other four subspecies might follow suit. David Quammen's idea of enable the poaching of a few individuals to benefit the conservation of the species might not be so drastic an approach after all, although animal rights' ideals might be compromised if some variation of it were to manifest. After all, we have compromised the fate of the tiger for all of these years; it may just be time for us to show that we can make serious compromises on behalf of something greater than ourselves.

Our reasons for saving the tiger could fall anywhere on the scales presented in this paper. We should conserve tigers for the sake of biodiversity, out of respect for history and cultural meaning, for science, for our children, to feed our sense of biophilia (even if we don't recognize it as such), or for the tiger's themselves. If we can all at least agree that they are worth saving, perhaps we can save them. It may be possible using a combined approach involving all the following: zoo enrichment and conservation, rewilding and rehabilitation, ecotourism, strictly enforced anti-poaching laws, compensation for losses incurred by tiger damage, and with the cooperation of people living in close proximity to wild tigers.

Had Ruby not been confiscated as a cub, she might have lived out her life right there in her natural habitat. It is likely that she would have staked her territory, bred some cubs of her own, and been included in a population census. Conversely, she might have been poached or poisoned. She might have wandered too close to human territory looking for food, and turned man-eater. None of these happened for Ruby. Her destiny was not entangled in the jungle operations of her native Siberia. She is with us and she belongs to us. Her impact, as an individual, is much greater at Mill Mountain than it would have been in her forest niche. I now understand many prevalent views in the debates over animals in

zoos, the zoos' role in science, and conservation dilemmas. Since knowing Ruby, I have seen firsthand her educational impact on the humans in her vicinity. Ruby lives far from the natural niche of her homeland. In spite of, or perhaps because of this, her existence represents a legendary influence that could have not been possible otherwise. Ruby's legacy has spanned those miles remarkably. Countless confiscated skins exist to remind us of the tiger of the past, and the battle that is still raging. Ruby is the tiger of the present, and signifies hope and understanding. Cathay and Hope, and all cubs that will follow their lead, could be the tigers of the future.

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