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THE RETREAT OF THE HUMAN: PROCESSES OF REWILDING AFTER
WARFARE IN SICHUAN, CHINA

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ABSTRACT

Decades of violent upheaval during the Late Ming and Early Qing in Sichuan caused the human population to decrease dramatically. Subsequent processes of rewilding reveal the tight connection between humans and their environment as well as the human interpretation of such dramatic changes. First, the irrigation facilities and former agricultural landscape of Sichuan deteriorated along with the decline of the human population. Due to lack of labour, the neglect and ultimate collapse of the Dujiangyan irrigation system in western Sichuan province resulted in rice-paddy agriculture becoming untenable. This led to the farmlands going through a process of rewilding. Then, when tigers proliferated and tiger-attacks became a common occurrence in Sichuan, the status of predator/prey and the activity spaces between humans and tigers were reversed. The tiger attacks were terrifying and interpreted as an example of social failure, representing the tension between human and environment that contributed to the

temporary retreat of the human from the Sichuan Basin.

KEYWORDS

domestication; irrigation systems; socio-ecological systems; Dujiangyan; tigers; conservation biology

INTRODUCTION

As the Ming Dynasty (1368-1644 CE) began to wane, peasant rebel forces led by Zhang Xianzhong believed they could establish a new dynasty by taking over Sichuan Province. After multiple incursions into Sichuan from his home base of Shaanxi, Zhang conquered the provincial capital Chengdu and declared himself king of Daxiguo in late 1644, but faced resistance from the remaining Ming Dynasty elite. Eventually, after recognising that the real threat was from the approaching Manchu armies of the newly established Qing Dynasty, Zhang decided in 1646 to return to Shaanxi and began a scorched earth campaign to prevent the Ming elite from taking back power in Sichuan after he left. When the retreat began, ‘Zhang at first allocated all the armies outside of [Chengdu] and stationed them in the suburban area temporarily. Then he ordered the battalions to burn all the buildings to ashes; as many as they could in all of the county-seats around Chengdu.’¹ This led to widespread famine and subsequent disease outbreaks across the province.² Additionally, the troops decided to destroy the city walls of Chengdu. Four years later, Zhang Chun, the new Qing Dynasty grand coordinator of Sichuan, wrote in his memorial that ‘all the ramparts in this area have collapsed, so tigers have invaded the city. The path turned out to be unobstructed.’³

¹ Ouyang Zhi, ‘Shu Luan’ (The upheaval of Shu), in He Rui (ed.), *Zhang Xianzhong Jiao Sichuan Shilu* (The Record of the Zhang Xianzhong’s Massacre in Sichuan), pp. 183–203 (Chengdu: Bashu Press, 2002), p. 192.

² Li Kwang-t’ao, ‘Some historical notes on Chang Hsien-chung’, *Bulletin of the Institute Of History and Philology Academia Sinica* **25** (1954): 21–30.

³ Zhang Chun, ‘Sichuan Xunan Zhang Chun Jietie (1650)’, in Guoli Zhongyang Yanjiuyuan Lishi Yuyan Yanjiusuo Zhe (eds), *Ming-Qing Shiliao Jiabian No. 6* (Shanghai: Shanghai Commercial Press, 1936), p. 51.

Many have written about Sichuan's demographic collapse and its slow recovery during the early Qing Dynasty (1644–1911). Estimates claim that just before the end of the Ming Dynasty, in 1644, Sichuan had roughly four million residents, but by 1680 the province likely only had a million living on the edge of the once productive Sichuan Basin.⁴ A more telling statistic regarding the devastation is that, during the Wanli period of the Ming Dynasty (1573–1620), registers tallied approximately 900,000 hectares of cultivated land in the province but in 1661 only around 75,000 hectares were still in use.⁵ While the depopulation of Sichuan is a well known part of late dynastic history in China, very little of this history has considered the environmental changes that emerged in the wake of war, social breakdown and the collapse of infrastructure. This period, during which human populations suffered under the Ming-Qing Transition – likely part of a global trend described as ‘the general crisis of the seventeenth century’⁶ – gives us a unique perspective from which to re-evaluate the historical discourse about human-environment interactions in China,

Other historians have demonstrated that, in some cases, the non-human world has gone through processes of rewilding during periods of human retreat. For instance, during the Second World War, the breach of the Yellow River's dikes at Huayuankou caused a massive flood across North China. Afterwards, the land became covered in swamps and overgrown vegetation, providing a perfect ecosystem for an increase in wild animals, like

4 Robert Entenmann, *Migration and Settlement in Sichuan 1644–1796*. Ph.D. Dissertation, Harvard University (1982), pp. 21, 59. These numbers are estimates made by Entenmann, as no population registers were taken during the period under discussion. For other estimates and discussions of Sichuanese demography from this period, see William Skinner, ‘Sichuan's population in the nineteenth century: Lessons from disaggregated data’, *Late Imperial China* 8 (1) (1987): 1–79; Hu Zhaoxi, ‘Zhang Xianzhong Tushu Kaobian’, *Bashu Lishi Wenhua Lunji* (Chengdu: Bashu Shushe, 2002), pp. 107–189; Junjia Li, ‘Mingmo Qingchu Sichuan de Dongluan ji Yingxiang’ (Upheaval and its effect in Sichuan during the late Ming and early Qing), in Long Xibin and Yu Xuequn (eds), *Dibajie Mingshi Guoji Xueshu Taolunhui Lunwenji* (Changsha: Hunan Renmin Chubanshe, 2001), pp. 73–81; Chen Shisong, *Da Yimin: Huguang Tian Sichuan Guxiang Jiyi* (Chengdu: Sichuan Renmin Press, 2015); Wang Di, ‘Qingdai Sichuan Renkou, Gengdi ji Liangshi Wenti (Shang)’, *Sichuan Daxue Xuebao (Zhaxue Shehui Kexue Ban)* No.3 (1989): 90–105.

5 Entenmann *Migration and Settlement in Sichuan*, p. 23.

6 Lynn A. Struve, *Voices from the Ming-Qing Cataclysm: China in Tigers' Jaws*. (New Haven: Yale University Press, 1993); Geoffrey Parker and Leslie M. Smith (eds), *The General Crisis of the Seventeenth Century* (London: Routledge and Kegan Paul, 1978).

foxes and badgers.⁷ Due to the military confrontation along the Korean Demilitarized Zone (DMZ), the absence of human activities has created ‘a zone left free for other species’.⁸ Richard P. Tucker also argued that ‘...in some circumstances warfare has actually reduced human pressure on nature, enabling other species to recover and flourish at least temporarily’.⁹ In other words, sometimes war provides the context in which rewilding can take place in the environment.

In this paper, we will argue that Sichuan went through decades of rewilding during the Ming-Qing Transition and that such a case helps us problematise the popular narrative in environmental history that claims China has been on a trajectory of ever greater exploitation of natural resources. The common narrative is that, by harvesting and burning woodlands, reclaiming land from lakes and building hydraulic facilities, Chinese ancestors simultaneously gained many benefits from the ecological system and damaged some parts of it. Additionally, elephants, tigers, horses, lakes and forests, as well as all kinds of landscapes, were forced to ‘retreat’ in response to mankind’s forward ‘march’. This narrative is also found in global environmental histories when China is discussed.¹⁰

7 Micah S. Muscolino, *The Ecology of War in China: Henan Province, the Yellow River, and Beyond, 1938–1950*. (Cambridge University Press, 2014), pp. 176–178.

8 Julia Adeney Thomas, ‘The exquisite corpses of nature and history: The case of the Korean DMZ’, *The Asia-Pacific Journal* no. 43 (October 2009): 3–10, here 3.

9 Richard Tucker, ‘The impact of warfare on the natural world: A historical survey’, in Richard Tucker (ed.), *Natural Enemy, Natural Ally: Toward an Environmental History of Warfare* (Corvallis: Oregon State University Press, 2004), pp.16–31, here 16.

10 Mark Elvin, *The Retreat of Elephants: An Environmental History of China*. (New Haven: Yale University Press, 2004); David Pietz, *The Yellow River: The Problem of Water in Modern China*. (Cambridge, MA: Harvard University Press, 2015), pp. 70–75. Robert B. Marks, *China: Its Environment and History*. (Lanham: Rowman & Littlefield Publishers, 2011); Nicholas K. Menzies, *Forest and Land Management in Imperial China*. (New York: St. Martin's Press, 1994), p. 136; Peter C. Perdue, *Exhausting the Earth: State and Peasant in Hunan, 1500–1850*. (Cambridge: Harvard University Press, 1987); Keith R. Schoppa, *Song Full of Tears: Nine Centuries of Chinese Life around Xiang Lake*. (Boulder, Colo.: Westview Press, 2002); Lillian M. Li, *Fighting Famine in North China: State, Market, and Environmental Decline, 1690s–1990s*. (California: Stanford University Press, 2007); Yan Gao, ‘The retreat of the horses: The Manchus, land reclamation, and local ecology in the Jiangnan Plain (ca. 1700s–1850s)’, in Liu Ts’ui-jung (ed.), *Environmental History in East Asia: Interdisciplinary Perspectives* (London and New York: Routledge, 2014), pp. 100–25. For examples of how global environmental history draws on this literature, see J.R. McNeill, ‘China’s environmental history in world perspective’, in Mark Elvin and Liu Ts’ui-jung (eds), *Sediments of Time: Environment and Society in Chinese History*. (Cambridge: Cambridge University Press, 1998); Robert B. Marks, *The Origins of the Modern World: A Global and Environmental Narrative from the Fifteenth to the Twenty-first Century*, 4th edition (Rowman & Littlefield, 2019), p. 45; Micah Muscolino, ‘Global dimensions of modern China’s environmental history’, *World History Connected* 6 (1) 1 (March

As we will argue here, there are exceptions to this conventional view that are important for our understanding, not just of the environmental history of China, but of human interactions with their landscape around the globe. Such exceptions are necessary to formulate a more accurate environmental history that is best conceived of as ever-fluctuating degrees of human interaction with a given ecosystem or species over a certain time period, eventually arriving at the coupled human-environment relationship we see today.¹¹ As Will has argued in the context of China, these fluctuations of human influence form a cyclical pattern between humans and their surrounding environment.¹² This article will serve to re-orient the historical perspective on the periods of rewilding that are essential to such cyclical relationships.

By analysing the collapse of irrigational infrastructure and increases in tiger attacks that occurred between 1644–1689 in Sichuan, we will argue that periods of rewilding in certain regions of China are crucial to understanding human interaction with the environment over time and even reinforced a belief in the righteousness of ‘civilisation’. More broadly, we also use this historical case to argue that ideas of rewilding need to be understood within cultural contexts at specific points in time. As we will see, the process of rewilding had very negative connotations in the past, which contrasts greatly with the excitement wildlife conservationists exhibit when promoting it in China today.

REWILDING, PAST AND PRESENT

In 2017, nearly ten years after the devastating Wenchuan Earthquake in Sichuan Province, China unveiled plans for the creation of the Giant Panda National Park. The earthquake had devastated both the built environment and the ecosystem in Northern Sichuan, home to eighty per cent of China’s endangered pandas. The government and conservation experts argue that only a massive effort to remove or limit human impact

2009): <http://worldhistoryconnected.press.illinois.edu/6.1/muscolino.html>

11 Carole L. Crumley (ed.), *Historical Ecology: Cultural Knowledge and Changing Landscapes* (Santa Fe, School of American Research Press, 1994); William L. Balée (ed.), *Advances in Historical Ecology*. (New York: Columbia University Press, 2002).

12 Pierre-Étienne Will, ‘Un cycle hydraulique en Chine: la province du Hubei du XVIIe au XIXe siècles’, *Bulletin de l’École française d’Extrême-Orient* **68** (1980): 261–287

from this region, where 170,000 people still live, can help to establish corridors for fragmented panda groups to begin interacting.¹³ The recolonisation of these corridors by diverse species as humans retreat from the environment is part of a new trend in biodiversity conservation described as rewilding.¹⁴

In recent years, projects of rewilding have become centerpieces of conservation biology across the globe. For instance, the Netherlands' Oostvaardersplassen includes a project of recolonisation with 'Bronze Age cows', originally bred by scientists bound to the Nazi doctrine supposedly to help return the European environment to a period that preceded human civilisational influence. Rewilding has also been promoted in places like Yellowstone National Park in the United States, where wolves have been reintroduced.¹⁵ It is no surprise that China has sent delegations to study such practices in Yellowstone for implementation in the Giant Panda National Park.¹⁶ Rewilding also includes allowing species to recolonise ecosystems from which they were removed centuries ago, such as the rewilding of horses in the Côa Valley of Portugal. Drawing on the Côa Valley case, DeSilvey and Bartolini show that the long-term interactions between humans and their environment can play a crucial role in the way a rewilding project can unfold. They demonstrate that not all rewilding efforts require the complete removal of human impact from an ecosystem, or de-coupling, in the manner that Lorimer and Driessen documented in the Netherlands. As DeSilvey and Bartolini rightly point out, how we understand the concepts of domestication and rewilding is haunted by issues of autonomy and temporality that structure processes of multispecies coupling.¹⁷

13 Alice Yan, 'Behind the urgent drive to unite China's giant panda habitats in one huge national park', *South China Morning Post*, 23 Sept. 2017 <https://www.scmp.com/print/news/china/society/article/2112093/behind-urgent-drive-unite-chinas-giant-panda-habitats-one-huge>; Jennifer S. Holland, 'China's new panda park will be three times bigger than Yellowstone', *National Geographic* (online), 10 May 2019 <https://www.nationalgeographic.com/animals/2019/05/giant-pandas-national-park-china/>

14 Jamie Lorimer, Chris Sandom, Paul Jepson, Chris Doughty, Maan Barua and Keith J. Kirby, 'Rewilding: Science, practice, and politics', *Annual Review of Environment and Resources* **40** (2015): 39–62.

15. Jamie Lorimer and Clemens Driessen, 'From 'Nazi cows' to cosmopolitan 'ecological engineers': specifying rewilding through a history of heck cattle', *Annals of the American Association of Geographers* **106** (3) (2016): 631–652; George Monbiot, *Feral: Rewilding the Land, the Sea, and Human Life* (Chicago: University of Chicago Press, 2014).

16 Holland, 'China's new panda park'.

17 Caitlin DeSilvey and Nadia Bartolini. 'Where horses run free? Autonomy, temporality and rewilding in

In terms of temporality, we have to be critical about how normative values can be imposed on the concept of domestication and recognise that the process of domestication is not necessarily a singular, linear path. The domestication of ancient rice is an excellent example where we know that human coupling with rice involved a number of iterations that today we would view as a complex relationship between domesticated and wild rice.¹⁸ In terms of autonomy, we must also be cautious about how we interpret processes of domestication and rewilding as being the result of intentional actions taken by people who wish to achieve a given outcome, such as with the Giant Panda Park and Yellowstone. Going back to the example of the domestication of rice, some have argued that initially foragers in China may have collected rice as a kind of pastime and it may have contributed very little to their overall diet.¹⁹ Although the rewilding occurring in biological conservation projects around the world is based on intentional decisions made, for instance, within the management structures of national parks, we should also recognise that rewilding has occurred and is continuing as the unintentional result of human activity. As mentioned above, warfare is one example where unintentional rewilding occurs. Previous research has documented examples of this, such as the military installations and airfields in Central Vietnam and the Demilitarized Zone between North and South Korea; however these studies tend to focus on the impact of weaponry and military strategy on the environment in forcing human activity to be removed from or adjusted within an area.²⁰ In this article, we look to the aftermath of war, where depopulation and the breakdown of infrastructure in an area result in rewilding, including the rise of species that prey upon humans, thus further preventing activity in the region.

These issues have great relevance for how we come to interpret multispecies interactions in environmental history, but there is an additional need to examine them at different

the Côa Valley, Portugal’, *Transactions of the Institute of British Geographers* **44** (1) (2019): 94–109; Lorimer and Driessen, ‘From “Nazi cows”’.

18 Tracey Lie-dan Lu, *The Transition from Foraging to Farming and the Origin of Agriculture in China*, BAR International Series No. 774. (Oxford: Archaeopress 1999).

19 Tracey Lie-dan Lu, ‘The occurrence of cereal cultivation in China’, *Asian Perspectives* (2006): 129–158.

20 David Andrew Biggs, *Footprints of War: Militarized Landscapes in Vietnam* (Seattle: University of Washington Press, 2018); Thomas, ‘The exquisite corpses of nature and history’.

times and in different cultural contexts. What is wild, much like what is wilderness, is the product of ‘very particular cultures at very particular moments in history’.²¹ While China may be excited about its Great Panda National Park today, we need to be cautious in assuming that processes of domestication and rewilding have always been invested with either positive or negative normative values and that such processes were the result of intentional actions taken by humans interacting with their environment. Thus, the case we present here goes a step further in the discussion of rewilding to examine a period of time in China’s Sichuan Province where the process was the unintentional result of war and, within the cultural context at that time, was interpreted as a serious failure of human society. In addition, we are also able to demonstrate the emotional reactions, namely fear, of survivors from this cataclysmic period as they watched previously human-dominated landscapes go through the process of rewilding.

SHEN XUNWEI’S VISION OF CHAOS AND THE COLLAPSE OF IRRIGATION INFRASTRUCTURE

A brief narrative from the period under discussion will help us frame our case. Seven-year old Shen Xunwei migrated along with his father into Sichuan in 1642 and lived in Huayang County, situated just to the South of the ancient provincial capital Chengdu. Not long after, the chaos caused by Zhang Xianzhong’s rebel forces resulted in the murder of Shen’s father during a riot. As a result, the boy had to hide in various places to avoid the upheaval of the following decades. By 1658, the army of the newly founded Qing dynasty had occupied the central part of Western Sichuan providing Xunwei with a chance to return to Chengdu.

The city had suffered through continuous warfare for almost sixteen years by that time. Xunwei saw a desolate scene on all sides of the city: ‘All that I saw was wildgrass and woods, elks were roaming in the street everywhere.’²² The streets and alleys with which

21 William Cronon, ‘The trouble with wilderness; or, getting back to the wrong nature’, in William Cronon (ed.), *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W.W. Norton & Co., 1995), pp. 69–90.

22 Shen Xunwei, ‘Shunan Xulue’, *Zhang Xianzhong Jiao Sichuan Shilu*, pp. 120–121, here 120

Xunwei was once quite familiar had totally changed. Even the city's core, the Palace of the *Shu* (*Shuwang fu*), was shrouded by brush. The Qing officers had to live in barbican entrances built during wartime, while soldiers hunted wild animals inside the city walls. In Xunwei's words: 'There were ferocious wild animals of all kinds, and we hunted them at that time. It went on like this for two or three years.'²³ Looking at the devastation, Xunwei recalled his forefathers and was tortured by sorrow both when awake and in his dreams. He wrote a poem:

Sixteen autumns have passed since I left Chengdu, who can help me cope with my myriad emotions?

Chengdu has been occupied by wildgrass for ages; elk roam among the grain fields;

God desires to obliterate the legacy of the Han Chinese Empire, but I alone am powerless to defend it from outside forces;

Although, in past and present, a civilisation's rise and fall is a common affair, I still cannot understand how such a thing could befall Sichuan.²⁴

Following this description by Shen Xunwei, we will analyse a period of rewilding in Sichuan Province during the 1640s to 1680s, which witnessed a collapse of irrigation infrastructure.

In order to understand the rewilding that occurred in Western China during the seventeenth century, it is important first to briefly describe the unique socio-ecological system that has emerged there over the last two millennia. The Chengdu Plain (or Western Sichuan Plain) is known as the 'Land of Abundance' (*tianfu zhi guo*), primarily due to the efficient Dujiangyan irrigation system that is fed by the Min River. Even

23 Shen Xunwei, 'Shunan Xulue', p. 120

24 Shen Xunwei, 'Shunan Xulue', pp. 120-121.

一別成都十六秋，滿懷積緒倩誰收？
錦城久屬荊榛據，金谷偏供麋鹿游
上帝有心沉漢鼎，孤臣無力仗吳鉤。
興亡古今雖恆事，不道猶能擬蜀州。

during the Maoist Era, this ancient feat of engineering was recognised as being the principal reason for the flourishing of agriculture and the spread of ‘civilisation’ throughout the Sichuan Basin.²⁵ As one of the Yangtze River’s tributaries, the Min flows eastward from the Tibetan Plateau into the Sichuan Basin and forms this fluvial plain. Around 256 BC, Li Bing and his son built a weir for irrigation and flood control at the site where the Min River emerges from the mountains; today this location is called Dujiangyan (or the Dujiang Weir). Because of the subtropical monsoon climate, farmers in the Chengdu Plain have had to deal with uneven seasonal water flow. The Dujiangyan irrigation system solved this by dividing the flow of the Min River with a natural split in the river called the Yu Zui (Fish Mouth). Li Bing was able to engineer a cut in a rock face further downstream to create a man-made gorge, called the Baoping Kou or Bottleneck, which would guide irrigation water East away from the main stem of the Min River and towards the center of the Chengdu Plain (Figure 1). In flood season, the Yu Zui would ensure that about sixty per cent of the water flows into the Outer River to protect the downstream metropolis of Chengdu from flooding. It has been said that Dujiangyan is ‘one of the greatest of Chinese engineering operations which, now 2,200 years old, is still in use and makes the deepest impression on all who visit it’.²⁶

25 Dujiangyan Guanli Chu, *Dujiangyan jieshao (Dujiangyan Introduction)* (Dujiangyan: Dujiangyan Guanli Chu Bianyin, 1953). Complex human settlements have existed in the region since the late Neolithic Era; for more, see Hua Sun, ‘The Sanxingdui Culture of the Sichuan Basin’, in Anne P. Underhill (ed.), *A Companion to Chinese Archaeology* (Sussex: Wiley-Blackwell, 2013), pp. 147–168.

26. Joseph Needham, Lu Gewei-Djen and Wang Ling, *Science and Civilization in China, Vol. IV, part 3: Civil Engineering and Nautics* (Cambridge: Cambridge University Press, 1971), p. 288.

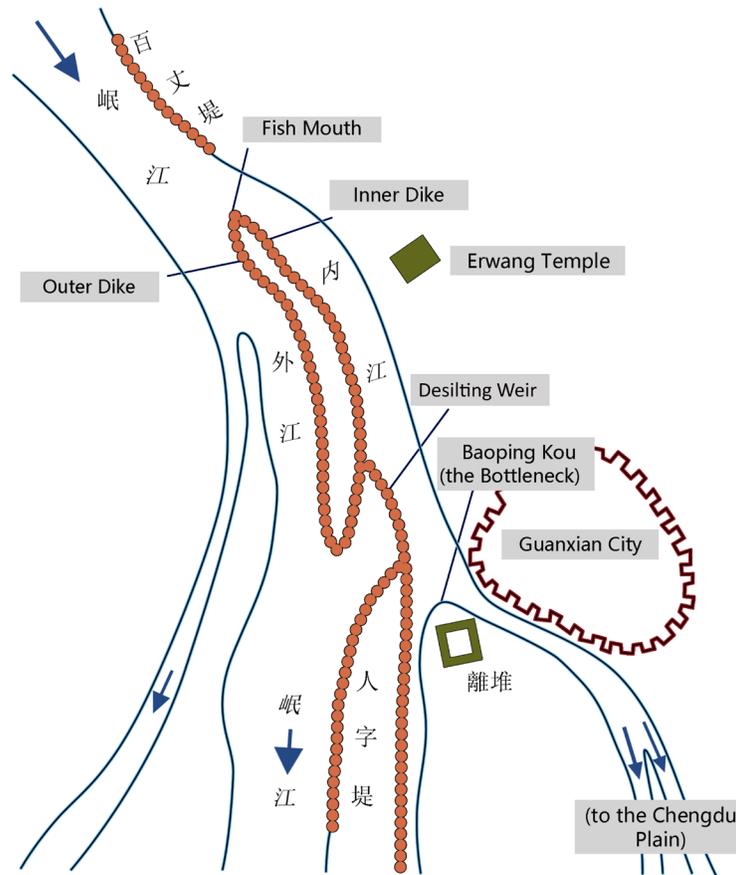


Figure 1. The Dujiang Weir

Suixiu (annual repair or maintenance) is the most important maintenance institution for Dujiangyan and the cornerstone of its sustainability. The earliest historical record of *Suixiu* is from the *Song Dynasty History*, written during the Yuan Dynasty (1271–1368):

Late each year, as the river becomes dry, people build up a temporary dike to cut off the upper river. Beginning with the first lunar month, the government recruits labor to dig up silt from the riverbed, this process is called *chuantao*.²⁷

The institution of *Suixiu* was improved and gradually set by the local population. Once local residents and authorities had decided upon some concise theories, like the concept *shen tao tan, di zuo yan* (dredge the banks deep and build the dikes low), and passed

27. Mieliqi Tuotuo, He Weiyi, Zhang Qiyan, Ouyang Xuan, Li Haowen and Wang Yi, ‘Hequ Zhi’ (The Gazetteer of Rivers and Canals), *Song Shi* (The History of Song), *juan* 95 (1972), p. 48.

regulations allocating the necessary labour and expense for *Suixiu* to each county in the Dujiangyan Irrigation Area, the *Suixiu* institution became more efficient and optimised.²⁸ Moreover, there were rules for emergency repair during the flood season, an annual grand ceremony that took place during *Qingming* (Tomb-sweeping Day) for the dismantling of the temporary dike, and daily worship gatherings dedicated to the local deities such as *Erlang* or *Chuanzhu*.²⁹ With regard to irrigation, Mark Elvin has emphasised that ‘a substantial proportion of the economy’s currently available resources (notably money, labor, materials, skills, and political and organizational capacity) were required for the *maintenance* of the system’.³⁰

The *Suixiu* institution relies heavily on periodic maintenance but has the advantage of efficiency and low cost. However, the need for regular maintenance means that the whole system is prone to collapse once human labour and material investment are removed from the system. For instance, in the spring of 1619, the hundreds of miles of canals in Chengdu Prefecture were suffering a severe water deficiency, causing great stress for residents of the basin. They believed that this drought was the consequence of the failure of the *Suixiu*-Principle’s implementation. In 1621, the *Chengdu Prefecture Gazetteer* concluded:

What Li Bing has done [and the rules he has set] is painstakingly brilliant, and it should not be violated by his successors. We cannot ignore the fact that once [such rules] have been violated, people will suffer. As the amount of labor and the [method of] building dikes has been set, all of these thousands of miles of fertile lands will rely on this. The administrators who take charge of this should focus on this principle.³¹

28 For more on the coordination and organisation of Dujiangyan during the Qing Dynasty see Xiande, ‘Dujiangyan Zhuopai Fujia Shu’ (Memorial regarding the allocation of labor and expenditure for the Dujiangyan), in Feng Guanghong (ed.), *Dujiangyan wenxian jicheng: Lishi wenxian juan* (Compiled documents on Dujiangyan: Historical documents) (Chengdu: Bashu Shushe, 2007), pp. 578–580.

29 James Hutson, ‘West Szechuen’s most remarkable work: Kwanhsien artificial irrigation’, *East of Asia Magazine* 4 (1) (1905): 145–61.

30 Mark Elvin, *The Retreat of Elephants*, pp. 123–124.

31 Feng Renxiu and Zhang Shiyong, *Xinxiu Chengdu Fuzhi* (A New Version of Chengdu Gazetteer), *juan* 6, (1621), 2.

According to local interpretation at the time, as soon as the maintenance of these canals is not performed properly, and the rules and principles like *shen tao tan*, *di zuo yan* are not followed, the whole hydraulic system will malfunction. While it is true that some social upheaval had already begun in Sichuan by 1621, Entenmann argues that ‘the demographic effect of these upheavals was not great’.³² In contrast, maintenance was almost totally absent due to the warfare and de-population of Sichuan during the Ming-Qing Transition (1640–1689), which brings us to a dramatic instance of collapse of the hydraulic facilities.

As local gazetteers of Dujiangyan explain, ‘after the upheaval, the weirs and channels in Chengdu area were silted and crumbled’,³³ and ‘hundreds of *zhang* [a unit of length, approximately 1–2 km] of Dujiangyan’s dikes were destroyed by flooding but without any repair’.³⁴ In 1659, as the Qing state had just conquered the key region of Sichuan downstream of Dujiangyan, officers like Gao Mingzhan and Chen Yifeng realised the terrible situation and its significant meaning for local socio-ecological recovery. They raised a special fund for some necessary repairs on Dujiangyan, and proposed to institutionalise this fund, forcing each county to contribute money for the repairs. Nevertheless, the *Baoping Kou* was still severely silted, and the Dujiangyan irrigation area could not get enough water, especially during Spring and Summer. It was not until 1681 that Grand Coordinator Censor-in-chief (*xunfu duyushi*), Hang’ ai, dispatched labourers to Dujiangyan to discover the original channel of *Baoping Kou* hidden within the wild, overgrown brush and had it dredged. It was because this area was left unmaintained and wild that the Dujiangyan scheme lost its hydraulic effect for more than two decades.³⁵ Beyond the impacts of flooding or military destruction, the collapse of the irrigation facilities presents yet another kind of mechanism through which environmental infrastructures disappear in the absence of daily and annual maintenance.³⁶

32 Entenmann, *Migration and Settlement in Sichuan*, p. 27.

33 Sun Tianning. *Guanxian Zhi* (Gazetteer of Guan County), *juan* 3 (1786), 57.

34 Huang Tingui and Zhang Jinsheng, *Sichuan Tongzhi* (the Gazetteers of Sichuan), *juan* 13 (1736), 49.

35 Sun Tianning, *Guanxian Zhi*, 58.

36 Emmanuel Kreike. *Environmental Infrastructure in African History: Examining the Myth of Natural Resource Management in Namibia* (Cambridge: Cambridge University Press, 2013).

During the Ming-Qing Transition, the once arable farmland in the Dujiangyan Irrigation Area suffered due to the lack of human labour to till the land, and also from the lack of proper irrigation. For the survivors, the deterioration of Dujiangyan changed this area from being water-abundant to water-deficient. The local gazetteers recorded that ‘in 1647, there was a severe famine in Sichuan, then it continued in the next year’.³⁷ The Gazetteer of Sichuan noted that ‘the survivors could only irrigate their land with very little water, making them live without any hope’.³⁸ The changing agricultural landscape was quite obvious to the scribes of local gazetteers at that time. During the *Shunzhi* period (1638–1661), the agricultural fields in Western Sichuan were replaced with wild plants, generating a kind of weed which according to a local resident, Liu Jingbo, was named ‘wild caltrop’ (*yeling*) or ‘magic weed’ (*qicaogen*). The following depiction by Liu Jingbo paints a vivid picture:

[At that time,] Western Sichuan was overgrown with a kind of ‘magic weed’. Its root is white and plump, and it can be cooked as pastry when ground into powder; it can be steamed as rice when cut into pieces. Its flavour is better than flour.³⁹

In this case, rewilding provided survivors with a food source that was not part of their diet before the collapse of the irrigation infrastructure.

Even in late 1683, when Fang Xiangying traveled around the Tongchuan area in Sichuan, he still saw that ‘everywhere had desolated farmlands which were once fertile; but the fields are surrounded by the thickset trees now’.⁴⁰ Around this time, Wang Shizhen, the well-known poet of the Qing Dynasty, lamented in his travel notes, ‘From Bazhong and Langzhong to Chengdu and Meishan, the metropolises that once prospered are now covered by endless weeds for thousands of miles.’ When Wang Shizhen passed by Meishan, hometown of another literary giant, Su Shi, he recalled Su’s verse, written in the Song Dynasty, that read: ‘the land of thousands of *qi* for planting rice’. But what

37 Ye Daqiang and Luo Junsheng, *Guanxian Zhi* (The Gazetteer of Guan County), *juan* 18 (1933), 2.

38 Huang Tingui and Zhang Jinsheng, *Sichuan Tongzhi*, 12.

39 Liu Jingbo, ‘Shugui Jian’ (The mirror of Shu-Turtle), in He Rui (ed.), *Zhang Xianzhong Jiao Sichuan Shilu* (Chengdu: Bashu Press, 2002), p. 316.

40 Fang Xiangying, ‘Shishu Riji (A diary in Shu)’, in Wang Xiqi (ed.), *Xiaofanghuzhai Yudi Congchao* 7 (Shanghai: Shanghai Zhuyitang, 1891), p. 50.

Wang saw was ‘only wasteland, wind and rain sweeping across the gloomy sky. For dozens of miles no smoke rose from any kitchen chimneys. The greatest desolation was found there.’⁴¹

For some survivors who were determined to live in their homeland, they found that the old, conventional method of farming rice paddies was very difficult to carry on without proper irrigation infrastructure.⁴² Although warfare and depopulation all led to the neglect of the agricultural landscape, the collapse of the hydraulic system and subsequent water deficiency itself should be considered as one of the reasons that the farmlands went through a process of rewilding.

THE MULTIPLICATION OF TIGERS AND TIGER ATTACKS

In 1655, Ouyang Zhi set out from Xuzhou in Southern Sichuan and sailed upstream along the Tuo River towards the Chengdu Plain. He saw dozens of tigers roaming around the river bank in an array. The first one in this array was a white tiger with rather long hair on its head. Then, when he passed the city of Neijiang and entered the town of Zizhou, they disembarked from the boat as they planned to stay there overnight. Suddenly, in the dim moonlight, Ouyang Zhi saw four tigers run by them. They survived because they hid in the brush just in time. Ouyang Zhi said that there were tigers everywhere in Sichuan, some of them even daring to climb up the wall of a building onto the roof, or approach and board boats by swimming, which had never been heard of before.⁴³ Chris Coggins has documented tiger attacks on urban centres in Southeast China but this was due to

41 As a unit of land, 1 *qi* is 50 *mu*, 1 *mu* = 0.06667 hectare. Wang Shizhen, ‘Shudao Yicheng Ji (The Travel Notes in the Way to Shu)’, in Wang Xiqi (ed.), *Xiaofanghuzhai Yudi Congchao* 7 (Shanghai: Shanghai Zhuyitang, 1891), p. 13.

42 Other scholars show a similar phenomenon. Francesca Bray discussed the relationship between the civil war and the collapse of hydraulic infrastructure around the Angkor agricultural heartland in Cambodia. She shows that the malfunction of hydraulic infrastructures during war at the beginning of the 14th century resulted in the region becoming ‘overgrown by scrub (veal), except in the immediate vicinity of reservoirs and rivers, where the modern villages stand on ancient Angkorian sites’. Francesca Bray, *The Rice Economies: Technology and Development in Asian Societies* (Berkeley: University of California Press, 1994), p. 75.

43 Ouyang Zhi, ‘Shu Luan’, 199.

tigers being pushed out of their habitats by deforestation.⁴⁴ In contrast, in Sichuan they were seen expanding into rapidly rewilding urban regions due to the depopulation of human residents.

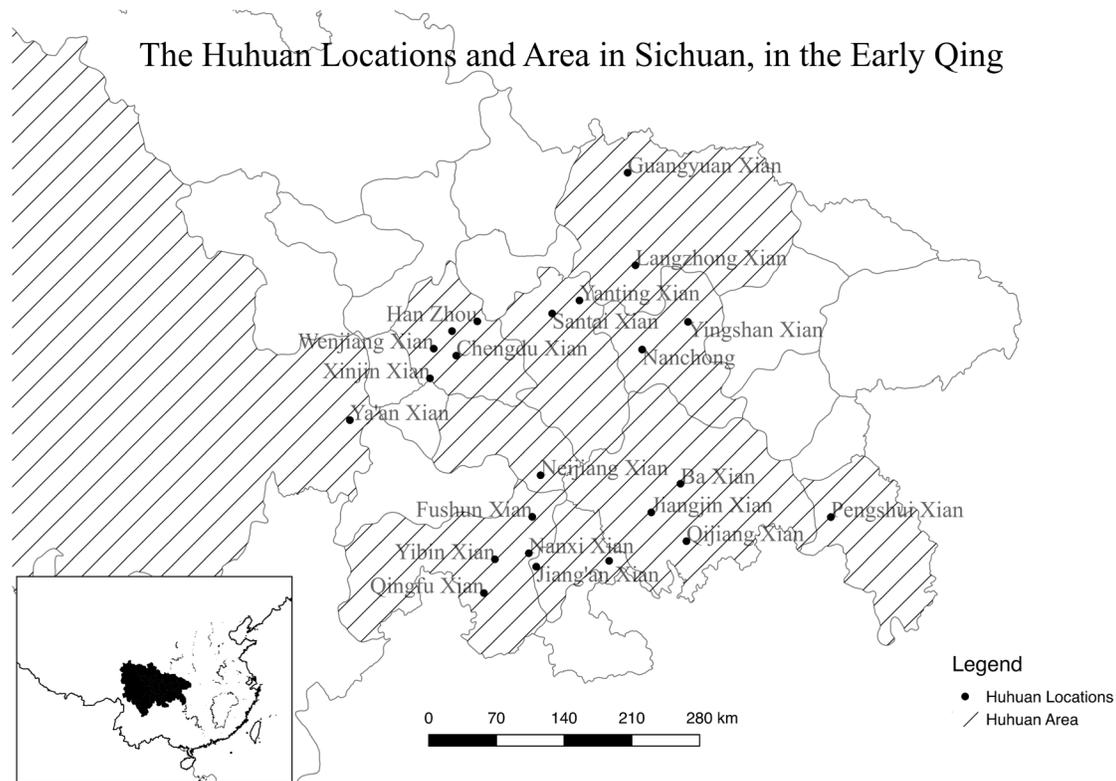


Figure 2. Tiger-Attacks in Qing-Era Sichuan (According to Historical Records).⁴⁵

44 Chris Coggins, *The Tiger and the Pangolin: Nature, Culture, and Conservation in China* (Honolulu: University of Hawaii Press, 2003), p. 63.

45 Sources: Reports of *huhuan* were found in the following 10 gazetteers as cited in Lan Yong, 'Qingchu Sichuan Huhuan yu Huanjing Fuyuan Wenti' (Tiger Attacks and Environmental Recovery in Qing Sichuan), *Zhongguo Lishi Dili Luncong* no. 3 (1994): 203–10; Wang Menggeng and Kou Zong, *Chongqing Fuzhi*, *juan* 9 (1843), 42; Weng Daojun and Xiong Yufan, *Yingshan Xianzhi*, *juan* 27 (1870), 2–3; Xie Kailai and Luoying Xiang, *Chongxiu Guangyuan Xianzhigao*, *juan* 27 (1940), 66; Yan Xishen and Chen Tianxi, *Jiang'an Xianzhi*, *juan* 4 (1923), 55; Wen Shaohai, *Nanxixian Xinzhi*, *juan* 9 (1937), 10–11; Cao Bingrang and Yang Geng, *Changning Xianzhi*, *juan* 12 (1808), 1; Wang Linxiang and Qiu Jincheng, *Xuzhou Fuzhi*, *juan* 49 (1895), 2; Zeng Shouyi and Wang Jiaju, *Jiangjin Xianzhi*, *juan* 5 (1768), 10; Zhuang Dingyu and Zhi Chenghu, *Pengshui Xianzhi*, *juan* 4 (1875), 73; Cheng Yunzhang and Chen Shaoqin, *Anxian Xuzhi*, *juan* 4 (1938), 2. Additional examples of *huhuan* were found in the following four sources as cited in Wang Gang, *Qingdai Sichuan Shi* (The History of Qing Sichuan) (Chengdu: Chengdu Keji Daxue Chubanshe, 1991), pp. 175–179; Li Liangjun and Wang Quanshan, *Xinxiu Nanchong Xianzhi*, *juan* 16 (1929): 49; Yuan Fengsun and Chen Rong, *Nanchong Xianzhi*, *juan* 16 (1813), 37; Song Hao and Luo Xing, *Qijiang Xianzhi*, *juan* 12 (1835), 4; Xiong Kuixiang and Zhou Shicheng, *Fushun Xianzhi*, *juan* 5 (1760), 22. We also documented examples of *huhuan* in the following five sources: Ouyang Zhi, 'Shu Luan', 198–201; Wang Peixun, *Tingyulou Suibi* (Informal Essays of Tingyulou) (Chengdu: Bashu Shushe, 1987), p. 59; Fang Xiangying, 'Shishu Riji', 50; Wang Shizhen, 'Shudao Yichengji', 13; Zhang Chun,

During the decades of upheaval, tigers showed up in great density, especially in Western, Northern, Northeastern and Southwestern Sichuan (Figure 2).⁴⁶ People at that time described these tiger attacks as *huhuan* (tiger disaster or tiger calamity). Some scholars have tried to argue that an increase in tiger attacks in written records represents evidence of deforestation. For instance, Robert Marks argued that ‘Reports of tiger attacks in the chronicles of Chinese gazetteers can serve as proxies for forests ... The destruction of tiger habitat by burning off the forest cover reduced the tigers’ food supply and contributed both to their willingness to enter villages searching for food and to their willingness to attack and eat people.’⁴⁷ The situation in Sichuan offers an alternative perspective on the issue of tiger attacks. For instance, Lan Yong has demonstrated that the activeness of tigers during the Early Qing is well connected to the rewilding that was occurring in the Western Sichuan Plain and in the agricultural areas in the hills. During this period of time, these areas were becoming filled with ‘shrubs, secondary forest and grass’ – prime habitat for tigers.⁴⁸

We also want to focus on two important, relevant aspects concerning this socio-ecological phenomenon. First, not only did tigers propagate quickly in Sichuan but other species like elks and wolves also flourished. For example, literati of the time wrote that ‘elks, wolves, and tigers were roaming around residential districts’⁴⁹ and ‘elks and wild boars were frisking through the streets ... the elks were very robust, and rushed to my left.

‘Sichuan Xun’an Zhang Chun Jietie’ (The Memorial of the Governor of Sichuan Province Zhang Chun), in Guoli Zhongyang Yanjiuyuan Lishi Yuyan Yanjiusuo (ed.), *Mingqing Shiliao (Jibian)* (The 1st Volume of Primary Sources in Ming and Qing) (Shanghai: Shanghai Shangwu Yinshuguan, 1936), pp. 519–520.

46. For research on the increasing population of tigers in Sichuan during this time, see Lan Yong ‘Lishishang Zhongguo Xi’nan Hua’nanhu Fenbu Bianqian Kaozheng (The Vicissitudes and Textual Criticism for Distribution of the Panthera Tigers Amoyensis on History in the Southwest-China)’, *Guizhou Shifan Daxue Xuebao (Ziran Kexue Ban)* no. 2 (1991): 54–60; Lan Yong, ‘Qingchu Sichuan’; Liu Zhenggang, ‘Mingmo Qingchu Xibu Huhuan Kaoshu’ (The Calamities of Tigers in Western China between Ming and Qing Dynasty), *Zhongguo Lishi Dili Luncong* no. 4 (2001): 98–104; Zhou Bangjun, ‘Qingdai Sichuan Tudi Kaifa Yu Huanjing Bianqian: Yi Shuituliushi Wenti Wei Zhongxin’ (Land Reclamation and Environmental Changes in Sichuan During the Qing Dynasty: Focusing on the Problem of Soil Erosion). *Xi’nan Jiaotong Daxue Xuebao (Shehui kexue Ban)* no. 3 (2006): 87–92.

47 Robert Marks, *Tigers, Rice, Silk, and Silt: Environment and Economy in Late Imperial South China*. (Cambridge University Press, 1998), p. 324.

48 Lan Yong, ‘Lishishang Zhongguo Xi’nan Hua’nanhu’, 56.

49 Wang Peixun, *Tingyulou Suibi*, p. 59.

The ants built their nests in the tree, which was piled up by earth. The beehives were as big as an umbrella, and almost hung down to the ground.’⁵⁰ As some scholars have argued, a high level of species richness and biodiversity is one of the characteristics of the rewilding process in a local ecosystem, which also occurred in the Chengdu Plain during the late seventeenth century.⁵¹ Second, the recorded frequency of ‘tigers’ in the gazetteers and literature was much higher than the other species mentioned above. Additionally, some of the peasant and literate chroniclers asserted that the population of tigers was especially large, with some claiming that ‘there were tigers everywhere in Sichuan’.⁵² Lan Yong also found one source that claimed that ‘after a patch of rain large numbers of tigers would suddenly appear from the hills’.⁵³

According to some interpretations of tiger attacks in South and Southeast China, people in traditional China believed that the occurrence of tiger attacks was a representation of social demoralisation, the weakness of the town god or political corruption. For this reason, some officials, like a magistrate of a county, might purposely exaggerate the number of tigers in the gazetteers in order to criticise the warlords, to indoctrinate society and preach ideas like *Xiao* (filial piety) and *Yi* (justice) to the masses.⁵⁴ The literati in the Chengdu Plain during the Qing Dynasty held a similar opinion. During the late Qing Dynasty, Liu Jingbo asked ‘Why during the collapse of the Ming Dynasty, in only three or four years time, were the mountains and swamp lands filled with tigers?’ He continued by saying that, on the contrary, after the first year of the Kangxi reign (1662), ‘...thousands of tigers disappeared suddenly for some unknown reason. Could this have occurred simply by the virtue of the Qing’s regime?’ Here Liu is purposefully being

50 Wang Yun, ‘Shuyou Jilue’ (The brief record of the travel in Shu), in Wang Xiqi (ed.), *Xiaofanghuzhai Yudi Congchao* 7 (Shanghai: Shanghai Zhuyitang, 1891), p. 1.

51 Lorimer et al., ‘Rewilding: Science, practice, and politics’.

52 Ouyang Zhi, ‘Shu Luan’, 199.

53 Lan Yong, ‘Lishishang Zhongguo Xi’nan Hua’nanhu’, 56.

54 Huang Zhifan. ‘Shanshou Zhi Jun, Huhuan and Daode Jiaohua: Cezhongyu Mingqing Nanfang Diqu’ (King of beasts, tiger calamity and ethics in the south in the Ming and Qing dynasties), *Zhongguo Shehui Lishi Pinglun (The Review on China's Society and History)* 7 (2006): 143–160; Xin Shangtian, ‘Shengtai Huanjing de Bianhua yu Quhuwen: 18 Shiji de Dongnan Shandi’ (The change of environment and the Quhu literature in southeast China’s mountainous area in the 18th century), in Wang Lihua (ed.), *Zhongguo Lishi shangde Huanjing yu Shehui (The Environment and Society in Chinese History)* (Beijing: Sanlian Shudian, 2007), pp. 524–541.

misleading for political purposes, as tiger attacks continued well into the Kangxi reign (1662–1722).⁵⁵ In Liu’s opinion, this phenomenon of rewilding in Sichuan was similar to the disasters at the end of the Xia and Shang Dynasty, which also saw many floods and beasts. So, he implied that ‘it was actually the consequence of the immorality of the emperors and ministers [of the Ming Dynasty]’.⁵⁶ During this period of transition, Liu also noted that,

The magistrates increased the tax levy sharply, the petty officials extorted residents excessively, these are all just tigers in the cities. The peasant rebel forces plunder everywhere, these are all just tigers in the watchtowers. The brothers fight amongst themselves, husbands and wives betrayed each other, these are all just tigers in the Imperial Court.⁵⁷

According to Liu, since humanity and tigers are all made of the same *qi*, ‘How can it be necessary to blame the tigers at all?’⁵⁸ In other words, while rewilding undoubtedly was occurring during this period of time, we have to make sure that the phenomenon of tiger attacks appearing regularly within our sources is properly interpreted within the local cultural context.

By drawing attention to this discourse of exaggeration we are not arguing that all tiger attacks were made up by Qing literati; on the contrary, literati recognised the rewilding during that period as a useful representation with which to attack the morality of the Ming Dynasty. Moreover, it provided Liu Jingbo with an opportunity to impress upon the reader that the morally righteous Qing Dynasty had led the people of Sichuan back to civilised society and away from the chaotic past of rewilding brought on by the Ming. Liu Jingbo was showering praise on the Qing Dynasty that ruled when he was writing and he did so using a particular interpretation of humanity’s relationship to tigers that would have been salient at that time. The narrative about rewilding that Liu Jingbo used

55 Lan Yong, ‘Qingchu Sichuan’.

56 Liu Jingbo, ‘Shugui Jian’, 291.

57 Ibid.

58 Ibid. For a more thorough explanation of the moral logic that underlies the Chinese worldview as structured by an all-encompassing concept like *qi*, see William Matthews, ‘Ontology with Chinese characteristics: Homology as a mode of identification’, *HAU: Journal of Ethnographic Theory* 7 (1) (2017): 265–285.

reinforced ideas about the moral superiority of ‘civilisation’ that he argued could only be provided by the Qing Dynasty.

While it is important to approach the question of interpreting rewilding from a cultural perspective that is appropriate to a given time period, we should also not overlook the fact that literate scribes may have been more prone to discuss the tiger population than the elk or wild boar because of the emotional shock they felt at the dramatically increasing frequency of tiger attacks during the Ming-Qing Transition in Sichuan Province. Robert Marks has shown us that, during the late Qing in the *Lingnan* region (in southern China), people and tigers came into more frequent contact due to human reclamation of land and tiger habitat degradation.⁵⁹ Thus, the relationship between people and tigers is usually interpreted as: Human (predator) => Tiger (prey). However, in Sichuan during the Early Qing dynasty, this relationship reversed into Tiger (predator) => Human (prey). People saw that

tigers were roaming inside the city walls day and night, and no one dared to drive them away. They became so emboldened that they hunted every person they met, some even climbing over fences [to reach their prey]. People were defenceless.⁶⁰

Powell describes a similar reversal of the predator-prey relationship in colonial Singapore as being terrifying for poor workers who were attacked by tigers that were moving into human modified landscapes of shrubs and secondary growth.⁶¹ Overall, the reversal of the ‘predator-prey’ relationship was an emotional shock for people. The *Liuli Waizhuan*, written by Han Guoxiang, stated that ‘... half of Sichuan’s people died because of warfare. After this, half of the survivors died because of famine, and the other half of the survivors died because of tigers. The people cannot bear this suffering anymore.’⁶²

Furthermore, due to the rewilding of the region, the tigers that once lived in the hills or forested areas intruded into human spaces, like rural towns and cities. Lan Yong has

59 Marks, *Tigers, Rice, Silk, and Silt*, pp. 277-308.

60 Duan Yucai, *Fushun Xianzhi*, *juan 5* (1880), 177.

61 Miles Alexander Powell, ‘People in peril, environments at risk: Coolies, tigers, and colonial Singapore’s ecology of poverty’, *Environment and History* **22** (3)(2016): 455–482.

62 Han Guoxiang, ‘Liuli Waizhuan’, in Li Liangjun and Wang Quanshan, *Xinxiu Nanchong Xianzhi*, p. 49.

summarised the range of tiger activity during the Tang and Song Dynasty from the historical literature. Areas of dense tiger population were in the Daba Mountains in Northern Sichuan, Fuzhou in Eastern Sichuan and the forests and hilly areas along some rivers in Southern Sichuan.⁶³ In contrast, most of the tiger attacks in the Early Qing occurred in urban areas.⁶⁴ As we mentioned in the introduction, Shen Xunwei fled his home to avoid upheaval and during his journey he heard that in a residential area

tens of families tried to live together in a few tall buildings defended by sturdy wooden fences, but it was useless. Tigers would simply pass over the buildings by jumping on the roof ... If someone had to go out to get some fresh water, they had no choice but to be armed with weapons and torches and beat a drum loudly, otherwise they would end up dead.⁶⁵

The fact that these man-eating beasts were freely entering city walls and feasting on people, struck great fear into people, and from fear grew a tendency to focus on tigers in their writing. This is a rational response for residents facing an increasing tiger population. Biologists have argued that the evolution of our amygdala has allowed for a kind of ‘conditioned fear’ even of large predators we have only heard about in stories.⁶⁶ Ultimately, according to the historical record, tiger attacks were taking place in Sichuan during this time of rewilding and, regardless of whether it was due to fear or politics, these attacks were important to the Sichuan people’s worldview at the time.

These primary sources about Sichuan display a departure from our traditional understanding of tiger attacks in China. The ‘retreat’ of China's elephants discussed by Mark Elvin demonstrates a conventional notion about China’s environmental history that asserts that the conflict between humans and other species occurred when the human population increased and they tried to reclaim more farmland.⁶⁷ Additionally, Robert Marks has argued that,

63 Lan Yong, ‘Lishishang Zhongguo Xi’nan Hua’nanhu’, 54–60.

64 Liu Zhenggang, ‘Mingmo Qingchu Xibu Huhuan Kaoshu’, 100.

65 Shen Xunwei, ‘Shunan Xulue’, 120–121.

66 Donna Hart and Robert W. Sussman, *Man the Hunted: Primates, Predators, and Human Evolution* (Boulder: Westview Press, 2008).

67 Elvin, *The Retreat of Elephants*, pp. 9–19.

As long as there were tigers, and as long as the Chinese state through the Qing emperor demonstrated ritual superiority over tigers, the Qing state was regnant. But unfortunately, as tiger habitat was transformed into farmland and tigers disappeared from much of China, so too did Qing state power.⁶⁸

Here Marks is primarily referring to very ritualised hunting events that occasionally involved the slaying of tigers. However, this does not necessarily paint a complete picture of the relationship between Imperial power and tigers across the Empire. As we have shown above, some Qing Literati, like Liu Jingbo, actually argued that the immorality of the Ming Dynasty was equivalent to the rising population of tigers and that the righteous power of the Qing was equivalent to the reduced numbers of tigers thereafter. Through the example of the Chengdu Plain during the Ming-Qing Transition, we can see that rewilding caused by the decline of the human population in the region led to a fierce conflict between the surviving humans and an increasing population of tigers, with complex symbolic interpretations and emotional responses arising from this socio-ecological shift.

CONCLUSION

In this case study, we assert that, while rewilding occurred due to the rapid depopulation of human settlements in the Chengdu plain, these changes were obviously not viewed in a positive light by local residents. Additionally, environmental factors that were tightly connected with human activities, such as irrigation infrastructure and rice-paddies, ‘retreated’ along with the human population. While rewilding may have allowed some species to flourish, the new relationship between humans and their environment was not perceived as ‘improved’ but rather exhibited a fierce conflict between the remaining survivors and tigers in their rewilding landscape, which is why we describe this period as the ‘retreat of the human’.

It is true that most of the Earth’s surface has been affected by human land-use activities

68 Robert B. Marks, ‘Asian tigers: the real, the symbolic, the commodity’, *Nature and Culture* 1 (1) (2006): 63–87, here 70.

for the past few millennia.⁶⁹ The material world does not exist as ‘purely natural’ and humans are just one component of the global socio-ecological system. However, this does not mean that all environmental factors have the same relationship with humans at all times. When humans interact with the non-human world, the influence is different in degree according to different circumstances. The Dujiangyan Irrigation System and the farmlands in this area could be regarded as one of the paradigms that shows the highly-connected relationship between people and their environment. The quantity of water supply running across the Chengdu Plain not only depends on natural precipitation but also on irrigation infrastructure. The efficiency of these dams, canals and dikes relies on human maintenance. Similarly, rice cultivation has existed in the Chengdu Plain for more than 4,000 years according to archaeological evidence.⁷⁰ This is a relatively self-sustaining and stable agricultural pattern, especially for the wet-rice fields and their soil, which can be ‘maintained almost indefinitely’.⁷¹ The depopulation of Sichuan led to the collapse and gradual siltation of irrigation channels as well as the desolation of farmlands. The sequences and the causality may be more complex than we thought: the collapse of local irrigation facilities brought the further deterioration of agriculture for the survivors who did not or could not abandon their homeland during the war and aftermath. Consequently, the local landscape changed drastically.

In the Chengdu Plain, the local ecosystem has been sustained at high levels of agricultural productivity for more than 2,000 years, experiencing only a few disturbances that have briefly disrupted this particular socio-ecological system, meaning that it is rather resilient in the face of sudden shocks.⁷² However, the processes of rewilding that occurred during the Ming-Qing Transition also created a large disturbance in the

69 Lucas Stephens, Dorian Fuller, Nicole Boivin, Torben Rick, Nicolas Gauthier, Andrea Kay, Ben Marwick et al. ‘Archaeological assessment reveals Earth’s early transformation through land use’, *Science* **365** (6456) (2019): 897–902.

70 Rowan Flad, Timothy J. Horsley, Jade D’Alpoim Guedes, He Kunyu, Gwen Bennett, Pochan Chen, Li Shuicheng and Jiang Zhanghua, ‘Survey, excavation, and geophysics at Songjiaheba – A Small Bronze Age site in the Chengdu Plain’, *Asian Perspectives* (2013): 119–142; Jiang Zhanghua and He Kunyu, ‘Chengdu Pingyuan Shiqian Juluo Fenxi’ (The Study on the Prehistoric Human Settlements in the Chengdu Plain), *Sichuan Wenwu* no. 6 (2016): 71–83.

71 Bray, *The Rice Economies*, p. 28.

72 Whiting, Susan H., Daniel Abramson, Shang Yuan, and Stevan Harrell. "A Long View of Resilience in the Chengdu Plain, China." *The Journal of Asian Studies* 78, no. 2 (2019): 257-284. .

relatively balanced relationship between the population of different species in the ecosystem. During this period, the typical predator-prey relationship between humans and tigers had been reversed, as did their former living spaces. In this reversion, the strained relationship between humans and their environment remained tense, which can be seen in the fierce conflicts that occurred between survivors and tigers. As this paper has shown, the changes within the human-environment relationship during the retreat of the human may have more meaningful details than we had previously assumed.

While discussing environmental change after the Vietnam War, Biggs argues that chemical composition of modern weaponry unintentionally leaves behind ‘footprints’ even as the environment enters a rewilding phase.⁷³ This example of rewilding may be somewhat limited, since some of the chemical destruction of the Central Vietnamese environment was scattered in patches where dumps of chemicals were left behind. As Biggs shows, in the aftermath of the war, the chemicals and military installations left behind areas with little vegetation and in some cases the People’s Army of Vietnam had simply repurposed these patches in a way that was not harmful to humans, such as by turning them into an asphalt driving course.⁷⁴ The larger areas of forest that were destroyed in the chemical attacks during the war were slated to be ‘regreened’ through large-scale tree planting efforts after the war. However, as Biggs notes, by the twenty-first century, forestry officials who were trying to ensure natural reforestation were under immense pressure from both local villagers and government officials who thought these plots should follow the path of nearby industrial monocropped forests that actually generated income.⁷⁵ Thus, while the initial stage of rewilding may have begun as an unintentional result of warfare, preserving rewilding in the face of economic pressure and local needs would have required an intentional form of conservation not unlike what we see in national parks.

Although it goes beyond the scope of this article, for much of the Qing Dynasty Sichuan faced a similar shift, after the imperial bureaucracy designated the province as tax free for

73 Biggs, *Footprints of War*, pp. 188–189.

74 *Ibid.*, p. 191.

75 *Ibid.*, pp. 192–193.

five years to any who would immigrate to the province and reopen the land that had become overgrown.⁷⁶ There is no evidence the land was intended to be preserved, but that also makes sense considering the way rewilding was interpreted at that time, as discussed above. Thus, in contrast to previous studies, the situation in Sichuan during the Qing Dynasty provides a case that allows us to see how unintentional rewilding at a large scale unfolds and its repercussions both for human and non-human populations. Because this process lasted for a number of decades, it also provided us with the possibility to investigate the cultural interpretations of rewilding from a number of perspectives during this era.

As stated above, in contrast to previous studies, our argument is about how weaponry or strategies of war impacted the Sichuanese environment, but rather that the reduction of the human population within a war-torn area then led to rewilding taking place in the surrounding environment for decades. We argue that it is not just war and weapons that can lead to rewilding, but the societal breakdown that comes in the wake of war, which then results in a collapse of the socio-ecological system. Specifically, we demonstrated how reduced population prevented the maintenance of infrastructure crucial to the stable operation of the socio-ecological system within the Sichuan Basin. Thus, the interrelated processes of war, social breakdown and collapse of infrastructure resulted in the emergence of rewilding as a new process within the socio-ecological system, whereby humans discover new relationships with the plant and animal species in their environment.

The case of Sichuan during this period highlights a unique aspect of unintentional rewilding. The difference between intentional and unintentional rewilding has significance with regard to human interaction with other species primarily as it relates to control. When rewilding occurs intentionally, it is still directed under some form of human control, making it still inherently anthropocentric. Intentional rewilding also tends to occur at small, manageable scales that may not severely disrupt a socio-ecological system. Unintentional rewilding could develop beyond human control. Interestingly, it also appears to be more ‘successful’, if by successful we mean allowing for the

⁷⁶ Entenmann, *Migration and Settlement in Sichuan*, p. 80.

flourishing of non-human species. However, at the same time, the example of the Ming-Qing Transition in Sichuan should give us pause with regard to the human suffering associated with unintentional rewilding. What happens to human society, for instance, when an intentional rewilding project begins advocating actions that have only previously occurred at the scale and speed of unintentional rewilding caused by warfare? These historical examples of unintentional rewilding can support a critical reflection on the ‘neopreservationism’ within wildlife conservation circles that are now calling for leaving fifty per cent of the planet to nature.⁷⁷

Our argument about unintentional rewilding is similar to what emerged after the toxic Rocky Mountain Arsenal was closed off to the public and designated a Wildlife Refuge. However, there was no later attempt to preserve the rewilded areas in Sichuan through such intentional actions.⁷⁸ On the contrary, after decades of rewilding, humans eventually repopulated Sichuan, requiring that the infrastructure needed to keep the socio-ecological system that supported such a large population be rebuilt and maintained. Thus, our primary argument is that rather than thinking of China’s environmental history as a single progression of ever greater human impact on the environment, it is crucial to include processes of collapse, rewilding and reconstruction to make our interpretations more accurately reflect the ever-changing relationships between humans and other species. Even one of the most resilient of China’s socio-ecological systems, the Chengdu Plain, was subject to an episode of rewilding that situated humans within a very vulnerable relationship with their local environment.

Finally, it is important to note the way this vulnerable relationship was interpreted. Many residents of Sichuan at the time were terrified of the tigers roaming in their residential areas. The cultural perception of the tiger attacks that occurred during this period of rewilding figured them as a representation of the collapse of society and the failure of humanity in Sichuan. Thus, as new intentional projects of rewilding begin in China’s emerging field of conservation biology, we should remember that there is nothing

⁷⁷ Bram Büscher and Robert Fletcher, *The Conservation Revolution: Radical Ideas for Saving Nature Beyond the Anthropocene*. (London: Verso, 2020).

⁷⁸ Paul S. Sutter, ‘Foreword: War is the land’, in David Andrew Biggs, *Footprints of War: Militarized Landscapes in Vietnam* (Seattle: University of Washington Press, 2018).

inherent within Chinese culture that led to the decision to create the Giant Panda National Park system. More importantly, we should realise that it is precisely because of these periods of rewilding that we are able to see how cultural belief in the glory of ‘civilisation’ influenced the way people in the past interpreted their relationship to the environment. Rather than assuming a singular, linear path of Chinese environmental history, not only do iterative steps of domestication and rewilding paint a more accurate picture on the ground, but, more importantly, these instances of rewilding reinforced the normative interpretation within Chinese culture that ‘civilisation’ and ‘continuity’ are a blessing. This perhaps should also give us pause to consider what intentional rewilding in the current era means to us? How should we expect future generations to interpret our decision to designate certain areas of the planet as ‘off-limits’ to human activity? Perhaps these are questions we should answer before making those designations. It would not pain us to first look to past periods of rewilding, whether intentional or not, to use as guides along this path humanity has decided to take in its approach to the non-human world.

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