

# How Many Wild Tigers Are There? An Estimate for 2008

*John Seidensticker<sup>1</sup>, Brian Gratwicke<sup>1,2</sup>,  
and Mahendra Shrestha<sup>2</sup>*

<sup>1</sup>Smithsonian's National Zoological Park,  
Washington, DC, USA

<sup>2</sup>Save The Tiger Fund, National Fish and Wildlife Foundation,  
Washington, DC, USA

## OUTLINE

Introduction	295	Results and Discussion	297
Methods	296	Acknowledgments	297
Country and Regional Estimates	297	References	298
<i>Indochinese Tigers</i>	297		

## INTRODUCTION

It has often been reported in the general press that there were 100,000 tigers in Asia at the beginning of the last century and 40,000 tigers in India in 1930 [1]. These estimates were given credibility and have been retained because they were based on 'expert' opinion.

Mazak prepared the first map of tiger distribution based on his extensive review of the locations where tiger specimens in museums were killed [2]. The records go back 250 years in some cases, and the conditions in most places where tigers were killed then are very different today, and many of these places can no longer support tigers. The most recent analysis of tiger habitats suggests that tigers now occupy only 7% of their historic range as mapped by Mazak, and that the area they occupy has decreased by as much as 40% in the past decade [3].

Knowing that tiger habitats are in severe decline, people ask: 'How many wild tigers are there today?' We do not know for certain, but the most commonly cited figure has been 5,000–7,000, derived from expert estimates compiled in 1998 by Peter Jackson, chairman of the IUCN Cat Specialist Group, for his report to CITES [4].

Since then, our understanding of wild tiger populations and their habitats in many of the range states has improved substantially. The pugmark census procedures used earlier by India and Bangladesh have been determined to be scientifically deficient [5] and as a result, India's Project Tiger instituted a country-wide program in 2005–2006 using a more rigorous sampling procedure to estimate tiger range occupancy and density [6]. Newer statistically robust estimates of tiger densities derived from camera-traps and population models, that estimate numbers using mark–capture–recapture methods [7] are now available in the peer-reviewed literature from India, Nepal, Thailand, Lao PDR, Malaysia, and Indonesia (Sumatra), and scientists in the Russian Far East recently reported the findings of their decadal winter tiger track count in 2004–2005 [8].

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## METHODS

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To arrive at the numbers presented here, we synthesised regional estimates of the world's remaining tiger populations based on the most recent, scientifically based estimates. We then supplemented knowledge gaps in data-deficient areas by extrapolating recently published peer-reviewed tiger density estimates for those subspecies in known remaining tiger habitat.

We do not have reliable minimum and maximum tiger population estimates for several tiger-range countries, but we do have tiger density estimates for multiple sites within the tiger's range, that often incorporate areas with varying habitat quality and levels of protection into their methods. We recognize that using average population density estimates and extrapolating them to remaining tiger habitats beyond their range of validity has some inherent risks of error. However, we believe that this extrapolation approach using a consistent and transparent method is preferable to our best previous tool—expert guesses. The numbers used to compile this estimate reflect the more recent, real-life situations within the tigers range, rather than habitat-based models that may lack ground-truthing.

To calculate the minimum population, we assumed that the entire suitable habitat occurring in high-priority level I Tiger Conservation Landscapes (TCLs) [9] were occupied at the mean tiger density reported for that subspecies. For the maximum population estimate, we assumed that the remaining suitable tiger habitats in all TCLs were occupied at the mean tiger density reported for that subspecies.

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## COUNTRY AND REGIONAL ESTIMATES

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Countries with tiger action plans: we used the tiger numbers provided in recently published tiger action plans for Bangladesh [10] Bhutan [11], Indonesia (Sumatra) [12], Malaysia [13], Myanmar [14], and Nepal [15]. We use the numbers released from the all-India tiger estimation completed in 2006 [16].

### Indochinese Tigers

The total area of TCL Class I in the range of Indo-Chinese tigers (Cambodia, China, Lao PDR, Eastern Myanmar, Thailand, and Vietnam) is estimated at 177,720 km<sup>2</sup> and 261,361 km<sup>2</sup> for all TCL classes [3]. We have reliable mean tiger density estimates of 0.45 per 100 km<sup>2</sup> for Nam Et-Phou Louey National Protected Area on the Lao-Vietnam border, with the lower density figures from areas with the high levels of human disturbance [17]. We derived minimum and maximum estimates for Indochinese tiger populations by multiplying the total Class I TCL areas (196,935 km<sup>2</sup>) [9] and the total area of all TCLs (273,240 km<sup>2</sup>) [9] by 0.0045, respectively.

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## RESULTS AND DISCUSSION

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We estimate a global population of 3,800 to 5,200 adult wild tigers with a mid-point of approximately 4,500 (Table 22.1). This is about a 25% decline since the last similar estimate in 1998, which estimated about 6,000 tigers [4]. This decline in tiger population estimates mirrors recent reports of tiger habitat loss [3].

Our current estimates of tiger numbers are arguably better than what we have previously ever had, yet critics could argue that the rigor and assumptions we have made to achieve this estimate make the confidence limits of our final estimates unacceptably wide. Indeed, the financial and logistic costs of monitoring these elusive carnivores are substantial. Conservation organizations on the ground are in a constant balancing act, often justifying the need for immediate conservation interventions as higher priority than the need for more accurate documentation of the demise of the species. Yet, conservation funders are hounding their grantees for proof that their investments have been working [18].

We are hopeful that conservationists will be able to make periodic landscape-level tiger population estimates that will allow us to detect population changes and to evaluate our conservation actions. These measurements will incrementally lead us to a better understanding of the global status of the world's largest and most charismatic cat.

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TABLE 22.1. Estimated adult tigers surviving in the wild, 2010

Tiger subspecies	Minimum	Maximum	Source
Indian (Bengal) tiger, <i>P.t. tigris</i> (Linnaeus 1758)	1790	2760	
Bangladesh	300	500	[10]
Bhutan	70	80	[11]
China	NRC		
India	1170	1660	[16]
Myanmar, Western	150	150	[14]
Nepal	100	370	[15]
Caspian tiger, <i>P.t. virgata</i> (Illiger 1815)	Extinct 1970s		[19]
Amur (Siberian) tiger, <i>P.t. altaica</i> (Temminck 1844)	330	390	
China	VF		[8]
North Korea	VF		[20]
Russia	330	390	[8]
Javan tiger, <i>P.t. altaica</i> (Temminck 1844)	Extinct 1980s		[21]
South China tiger, <i>P.t. amoyensis</i> (Hilzheimer 1905)	Possibly extinct in the wild		[22]
Bali tiger, <i>P.t. balica</i> (Schwarz 1929)	Extinct 1940s		[21]
Sumatran tiger, <i>P.t. sumatrae</i> (Pocock 1929)	300	300	[12]
Indochinese tiger, <i>P.t. corbetti</i> (Mazak 1968)	880	1230	See methods
Malayan tiger, <i>P.t. jacksoni</i> (Luo et al. 2005)	500	500	[13]
Totals	<b>3,800</b>	<b>5,180</b>	

Note: All estimates rounded to the nearest 10.

NRC, Not Recently Confirmed.

VF, Presence verified, but at very low numbers, not tallied.

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