Table 3.4
Population estimates of tigers in tiger reserves for the year 2018-19.

State		Tiger Reserves	Tigers utilizing the Tiger Reserve		Tigers within the Tiger Reserve	
			Tiger Number	SE	Tiger Number	SE
Shivalik Hills and Gangetic Plains						
1.	Bihar	Valmiki	33	1	32	0.06
2.	Uttar Pradesh	Dudhwa	107	16	82	3.4
3.	Uttar Pradesh	Pilibhit	65	3	57	0.3
4.	Uttarakhand	Corbett	266	6	231	0.3
5.	Uttarakhand	Rajaji	52	5	38	1
Central India and Eastern Ghats						
6.	Andhra Pradesh	Nagarjunasagar Srisailam	43	2	38	0.03
7.	Chhattisgarh	Achankamar	-	-	5	-
8.	Chhattisgarh	Indravati*	3	-	3	-
9.	Chhattisgarh	Udanti Sitanadi	-	-	1	-
10.	Jharkhand	Palamau	-	-	0	-
11.	Madhya Pradesh	Bandhavgarh	124	5	104	0.43
12.	Madhya Pradesh	Kanha	108	5	88	0.45
13.	Madhya Pradesh	Panna	31	3	25	0.5
14.	Madhya Pradesh	Pench	87	10	61	4
15.	Madhya Pradesh	Satpuda	47	2	40	0.02
16.	Madhya Pradesh	Sanjay Dubri	6	-	5	-
17.	Maharashtra	Bor	-	-	6	-
18.	Maharashtra	Melghat	49	2	46	0.04
19.	Maharashtra	Navegaon Nagzira	6	1	6	0.003
20.	Maharashtra	Pench	82	8	53	2.5
21.	Maharashtra	Sahyadri*	-	-	3	-
22.	Maharashtra	Tadoba	106	6	83	1.15
23.	Odisha	Satkosia	-	-	1	-
24.	Odisha	Simlipal	12	1	8	0.04
25.	Rajasthan	Mukundra	-	-	1	-
26.	Rajasthan	Ranthambore	55	1	53	0.17
27.	Rajasthan	Sariska	-	-	11	-
28.	Telangana	Amrabad	9	2	7	0.25
29.	Telangana	Kawal	-	-	1	-
Western Ghats						
30.	Karnataka	Bandipur	173	12	126	2
31.	Karnataka	Bhadra	38	4	30	0.32
32.	Karnataka	Biligiri Rangaswamy Temple	86	8	52	0.25
33.	Karnataka	Anshi Dandeli (Kali)	11	-	4	-
34.	Karnataka	Nagarhole	164	7	127	0.43
35.	Kerala	Parambikulam	33	3	26	0.2

State		Tiger Reserves	Tigers utilizing the Tiger Reserve		Tigers within the Tiger Reserve	
			Tiger Number	SE	Tiger Number	SE
36.	Kerala	Periyar	33	6	26	0.46
37.	Tamil Nadu	Anamalai	25	3	20	0.23
38.	Tamil Nadu	KMTR	8	1	7	0.01
39.	Tamil Nadu	Mudumalai	162	10	103	0.38
40.	Tamil Nadu	Sathyamangalam	126	6	83	2
NE Hills and Brahmaputra Plains						
41.	Arunachal Pradesh	Kamlang[#]	-	-	4	1
42.	Arunachal Pradesh	Namdapha[#]	-	-	11	1
43.	Arunachal Pradesh	Pakke	-	-	3	-
44.	Assam	Kaziranga	135	7	104	10
45.	Assam	Manas	31	2	31	2
46.	Assam	Nameri	-	-	3	-
47.	Assam	Orang	21	3	21	2.8
48.	Mizoram	Dampa	-	-	0	-
49.	West Bengal	Buxa	-	-	0	-
Sundarban						
50.	West Bengal	Sundarban	106	4	88	2

#: MaxEnt model result; *: scat DNA result

** Same three tigers in Nameri and Paake. In some tiger reserves that abut each other (Bandipur, Madumalai, and Satyamangalam; Pench – Madhya Pradesh and Pench - Maharashtra) individual tigers could be double counted. These double counts are accounted for in estimating the tiger population at the landscape and State scale. In order to minimize double count of tigers the estimate of "Tigers within Tiger Reserves" is to be used.

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Tiger occupancy was found to be stable at 88,985 km^2 at the country scale since 2014 (88,558 km^2). Though there were losses and gains at individual landscapes and state scales. The occupancy reported in this report is based on latest forest cover by Forest Survey of India (2017) and therefore cannot be compared with earlier occupied areas which were computed from earlier forest cover data. To make the comparison on the same scale we have recomputed tiger occupied forests for the 2014 cycle on the forest cover of 2017 (Table 3.2). Reduction in occupied areas was due to a) not finding evidence of tiger presence in sampled forests (20% actual loss), and b) not sampling forests that had tiger presence in 2014 (8 %). New areas that were colonized by tigers in 2018 constituted 25,709 (28%) km^2. This analysis suggests that loss and gain of tiger occupancy was mostly from habitat pockets that support low density populations. Such habitats with low density tigers, though contributing minimally to overall tiger numbers, are crucial links for gene flow and maintaining connectivity between source populations. The loss and gain of tiger occupancy in these marginal areas is a dynamic process and depends on several factors like proximity of a tiger source population, anthropogenic pressures operating in the landscape, associated change in habitat conditions and protection regime. Tiger occupancy has increased in the state of Madhya Pradesh, and Andhra Pradesh. Loss in North East is due to poor sampling. Madhya Pradesh has also registered a substantial increase in their tiger population and along with Karnataka ranks highest in tiger numbers. The poor and continued decline in tiger status in the states of Chhattisgarh, Jharkhand and Odisha is a matter of concern. The largest contiguous tiger population in the world of about 724 tigers was found in the Western Ghats (Nagarhole-Bandipur-Wayanad-Mudumalai-Satyamangalam-BRT block) while the second largest population of about 604 tigers was found across Uttrakhand and western Uttar Pradesh (Rajaji-Corbett-Ramnagar-Pilibhit-Dudhwa block) (Fig. 3.3). There were now eight tiger populations in India and trans-boundary Sundarban that numbered over 100 individuals and served as major source populations in the landscapes (Fig. 3.3).

Landscape	Tiger occupancy 2014	Tiger occupancy 2018	Difference	Gain 2018	Tiger present in 2014 but not sampled in 2018	Actual loss
Shivalik	8,815	8,346	-469	688	279	904
Central India	40,185	47,717	7,532	18,089	276	10,216
Western Ghats	27,824	27,297	-527	5,778	769	5,524
North East	9,901	3,312	-6,589	675	6,040	1,237
Sundarban	1,834	2,313	479	479	0	0
India	88,558	88,985	427	25,709	7,364	17,881

Table 3.2
Tiger occupied forests (km^2) for 2018 and 2014 for each landscape. Forest Survey of India (2017) forest cover is used for computation of forest occupancy.

Since full coverage by field surveys using standardized protocols (Jhala et al. 2017) were done only in the Shivalik-Gangetic Plains Landscape, Central Indian and Eastern Ghats Landscape, and the Western Ghats landscape, we limit the following analysis to 9,402 grids of 100 km^2 that were sampled within these three landscapes. Sundarban though sampled entirely with field survey and camera traps was not included in this analysis as the field protocols differed substantially.

We classified these 9,402 grids into six categories based on tiger density estimated in them (Table 3.3). Majority of the grids did not have tigers (83%), and about 2% had high density of tigers. Of the 1,673 grids with tiger presence, 1,397 (85.3%) were camera trapped. Thus, covariate model-based inference was used to infer tiger density and numbers for only the remaining 14.7% of the area occupied by tigers. Grids with high tiger density were all camera trapped (Table 3.3), and population estimates for these were obtained from SECR.

Table 3.1

Estimated tiger numbers in States and Landscapes of India. Numbers in parenthesis are one standard error limits of the mean.

State	Tiger Population			
	2006	2010	2014	2018
Shivalik Hills and Gangetic Plains Landscape				
Bihar	10 (7-13)	8	28(25-31)	31 (26 - 37)
Uttarakhand	178 (161-195)	227 (199-256)	340 (299-381)	442 (393 - 491)
Uttar Pradesh	109 (91-127)	118 (113-124)	117 (103-131)	173 (148 - 198)
Shivalik-Gangetic	**297 (259-335)**	**353(320-388)**	**485 (427-543)**	**646 (567 - 726)**
Central Indian Landscape and Eastern Ghats				
Andhra Pradesh	95 (84-107)	72 (65-79)	68 (58-78)	48 (40 - 56)#
Telangana	-	-	-	26 (23 - 30)#
Chhattisgarh	26 (23-28}	26 (24-27)	46 (39-53)*	19 (18 - 21)
Jharkhand		10 (6-14)	3*	5
Madhya Pradesh	300 (236-364)	257 (213-301)	308 (264-352)*	526 (441 - 621)
Maharashtra	103 (76-131)	168 (155-183)	190 (163-217)*	312 (270 - 354)
Odisha	45 (37-53)	32 (20-44)	28 (24-32)*	28 (26 - 30)
Rajasthan	32 (30-35)	36 (35-37)	45 (39-51)	69 (62 - 76)
Central India & Eastern Ghats	**601 (486-718)**	**601 (518-685)**	**688 (596-780)**	**1,033 (885- 1,193)**
Western Ghats Landscape				
Goa	-	-	5*	3
Karnataka	290 (241-339)	300 (280-320)	406 (360-452)	524 (475 - 573)
Kerala	46 (39-53)	71 (67-75)	136 (119-150)	190 (166 - 215)
Tamil Nadu	76 (56-95)	163 (153-173)	229 (201-253)	264 (227 - 302)
Western Ghats	**402 (336-487)**	**534 (500-568)**	**776 (685-861)**	**981 (871 - 1,093)**
North East Hills and Brahmaputra Plains Landscape				
Arunachal Pradesh	14 (12-18)		28*	29*
Assam	70 (60-80)	143 (113-173)	167 (150-184)	190 (165 - 215)
Mizoram	6 (4-8)	5	3*	0
Nagaland	-	-	-	0
Northern West Bengal	10 (8-12)	-	3*	0
North East Hills, and Brahmaputra	**100 (84-118)**	**148 (118-178)**	**201 (174-212)**	**219 (194 - 244)**
Sundarban		70 (62-96)	76 (62-96)	88 (86-90)
TOTAL	**1,411 (1,165-1,657)**	**1,706 (1,507-1,896)**	**2,226 (1,945-2,491)**	**2,967 (2,603-3,346)**

*: Scat DNA based estimates were also used

#: For comparison with previous estimates of Andhra Pradesh, combine Andhra Pradesh and Telangana population estimate of current year