



WESTERN GHATS



3

WESTERN GHATS LANDSCAPE

From an ecological perspective, this region with a total forested area of 1,01,467 km² (Qureshi et al. 2006) comprising of nine notified Tiger Reserves, three proposed Tiger Reserve, viz., Sathyamangalam Tiger Reserve in Tamil Nadu and Kudremukh and Biligiri Rangaswamy Temple Hills (BRT) Wildlife Sanctuary in Karnataka; 20 National Parks and about 68 Wildlife Sanctuaries forms one of the largest Protected Area networks in India. The Nilgiri and Agasthiya-Malai Biosphere Reserves are also located within this zone in addition to several Reserved Forests and sacred groves, totalling to about 5.8% of the total forested area in the Western Ghats alone. This landscape has the potential to have contiguous tiger occupancy from the Dang forests in Gujarat up to the Palakkad Gap in Kerala and then again from Parambikulam-Indira Gandhi complex upto Kalakad-Mundanthurai Tiger Reserve. Within this landscape the most important source population is the Nagarahole-Mudumalai-Wayanad population which spans the three States of Karnataka, Tamil Nadu and Kerala with a high density (average density of over 4 tigers per 100 km²) tiger population occupying a large area (over 9000 km²). The other sources though occupying sufficiently large patches of habitat are of low tiger density (1-2 tigers per 100 km²) and their nuclei are centred within Protected Area complexes. These source populations are Kalakad-Mundanthurai, Periyar and the Parambikulam-Indira Gandhi complex south of the Palakkad Gap, while Kudremukh, Bhadra, Anshi and Dandeli are north of the Palakkad Gap. A few tigers are also recorded from the forests in Goa and from the Sayahadri Tiger Reserve in

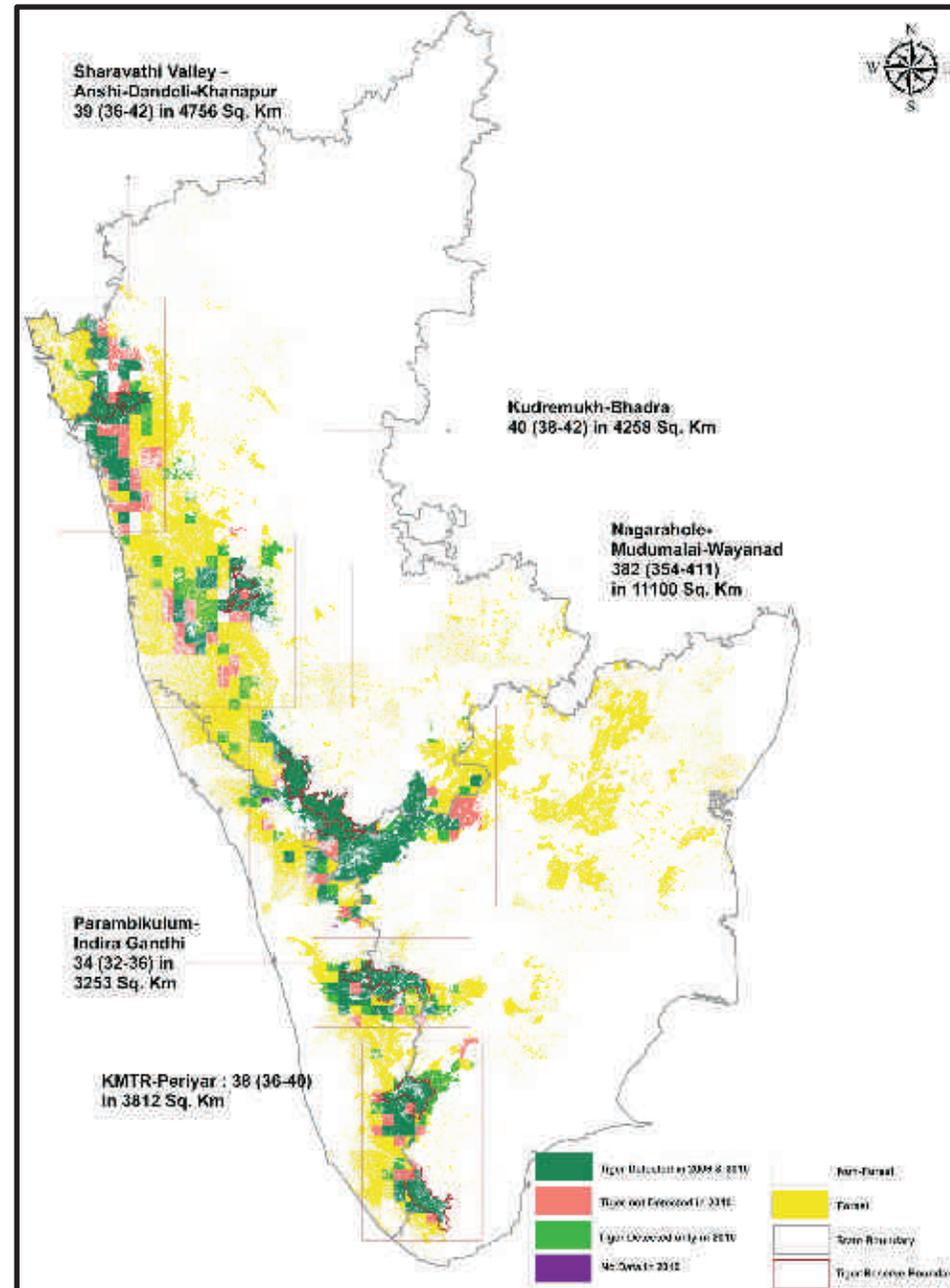
Maharashtra. The populations in Goa and Maharashtra depend significantly on the narrow forest connectivity of the Western Ghat ridge.

The Western Ghat tiger populations are more connected with each other when compared to tiger populations in Central India and the Shivalik-Gangetic Plains landscapes. The habitat matrix in the Western Ghats is more conducive for tiger occupancy. However, the habitat connectivity is threatened by plantations, agriculture, industrial and infrastructural development. It would be prudent to timely identify and legitimize the minimal corridors needed for the conservation objective of ensuring gene flow between the Western Ghats tiger populations in times to come. The major impediments to tiger conservation in this zone are the existence of hydro-electric projects, hunting (Madhusudan and Karanth 2002) and deforestation of large areas for commercial plantations.

The Least Cost Path analysis provides the optimal corridor between Protected Areas. The minimal corridors defined here need to be safeguarded through policy and formal legislation. A designation of "ecosensitive areas" to these minimal habitat corridors would ensure that land uses within these corridors are not altered to such drastic levels that the corridors become non-functional and lose their conservation significance. These corridors have been designed based on the habitat potential for supporting tigers (occupancy probability), however, they would also fulfill the needs of many other wildlife species.



Figure 3.1:
Habitat Connectivity in
Western Ghats
Landscape



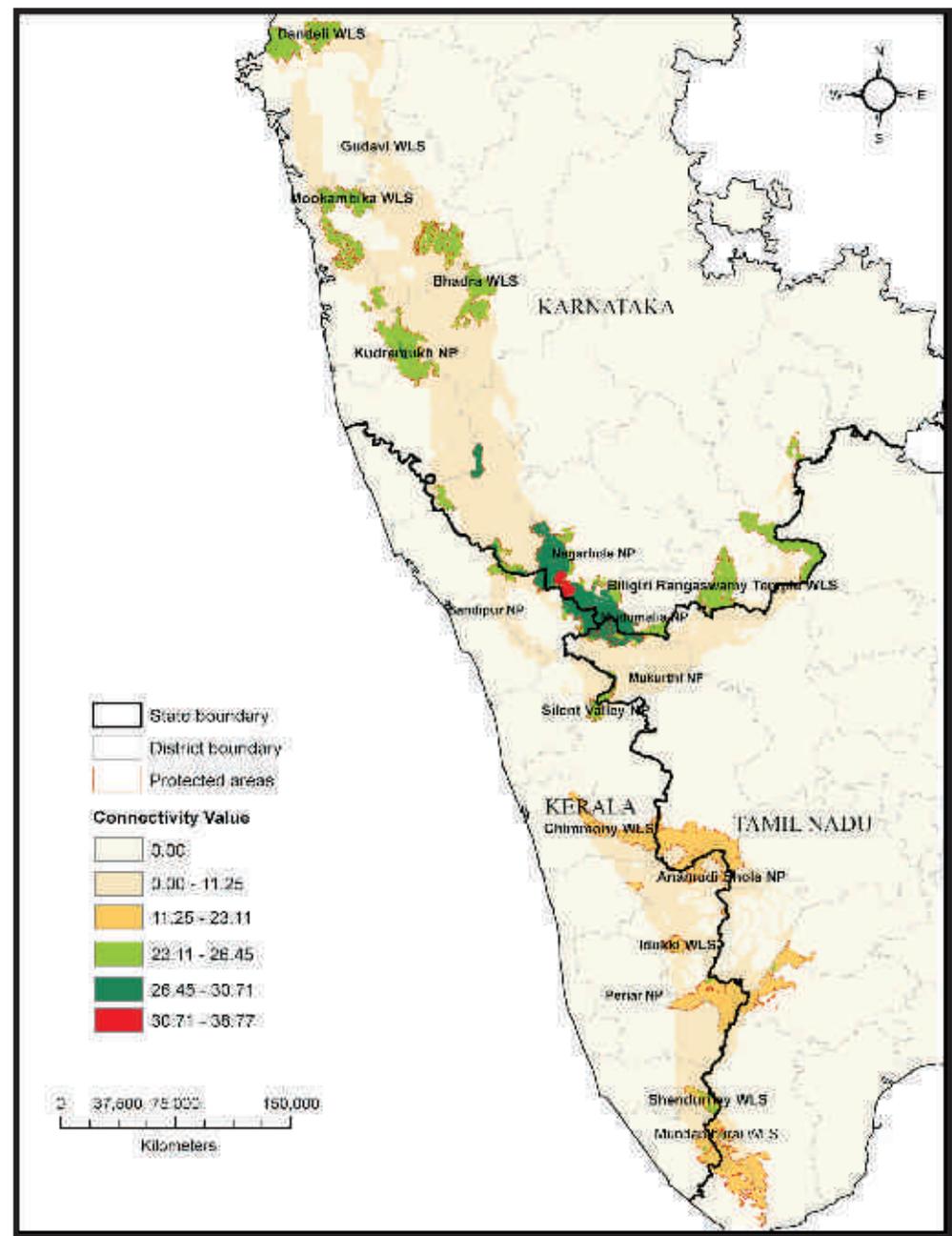


Figure 3.2:
Potential habitat connectivity for tiger movement between Western Ghats as depicted by CIRCUITSCAPE model



ANSHI-DANDELI-SHARAVATHI VALLEY

This complex consists of the protected areas of Mollam-Netravali, Anshi-Dandeli, Sharavathi Valley-Mookambika along with Reserved Forests of Haliyal and Yellapur. To the north, this complex is connected to the forests of Goa which continue to the Sahayadri Tiger Reserve in Maharashtra with sporadic records of tiger occupancy. While the forest connectivity between this complex and the southern Kudremukh-Bhadra complex is weak, interspersed by plantation and agricultural mosaics, evidence exists through camera trapped pictures to confirm movement of tigers between the two areas (Ullas Karanth, Pers. Com.). Tiger population in 2010 within this region was estimated to be between 36 and 42 tigers with occupancy in an area of 4,756 km², indicating a decline in tiger occupied area since 2006. This decline was observed in the forests connecting Anshi-Dandeli to forests of Goa in the north and to forests of Sharavathi Valley in the south.

Anshi and Dandeli are connected through contiguous forests, the least cost pathways (north of Ulavi settlement), formalizing this connectivity would secure these forests for the future. The corridor connectivity between Anshi-Dandeli and Sharavathi Valley is long and traverses through plantation and agriculture mosaics. However, the least cost pathway and Circuitscape flows minimizes passage through private lands and suggests the ideal corridor to connect the two major tiger landscapes of Karnataka. Two corridors, one from Anshi and another from Dandeli emerge from either side of the Kodasalli Reservoir and meet north of the Benne Hole falls. The bottlenecks for this corridor were at Jog Falls where a narrow strip of forest (1.5 km) remains as a connectivity. This connectivity, if formally recognized and restored would promote gene flow across major populations of the Western Ghats from Pune to Palakkad.

| Anshi-Dandeli-Sharavathi Valley Corridor | |
|---|---|
| Habitat size | 40589 Sq. Km ² |
| Source Population | Anshi NP Dandeli WLS |
| Size of Source | 39 (36-42) tigers in 4756 Km ² |
| Protected Areas | Anshi NP Dandeli WLS Sharavathi WLS |
| Corridors | Dandeli-Sharavathi WLS Anshi-Sharavathi WLS Dandeli-Anshi WLS |

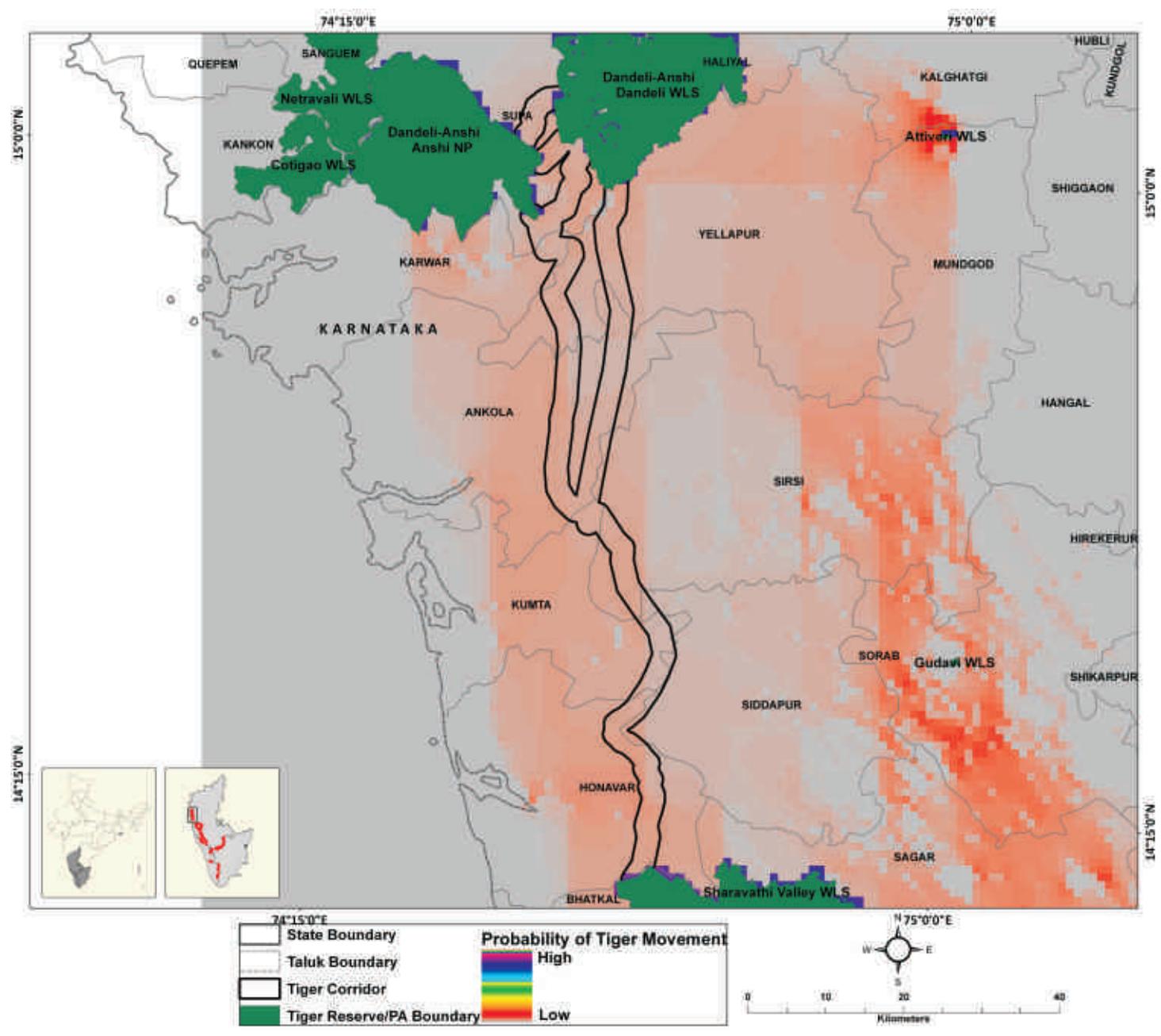
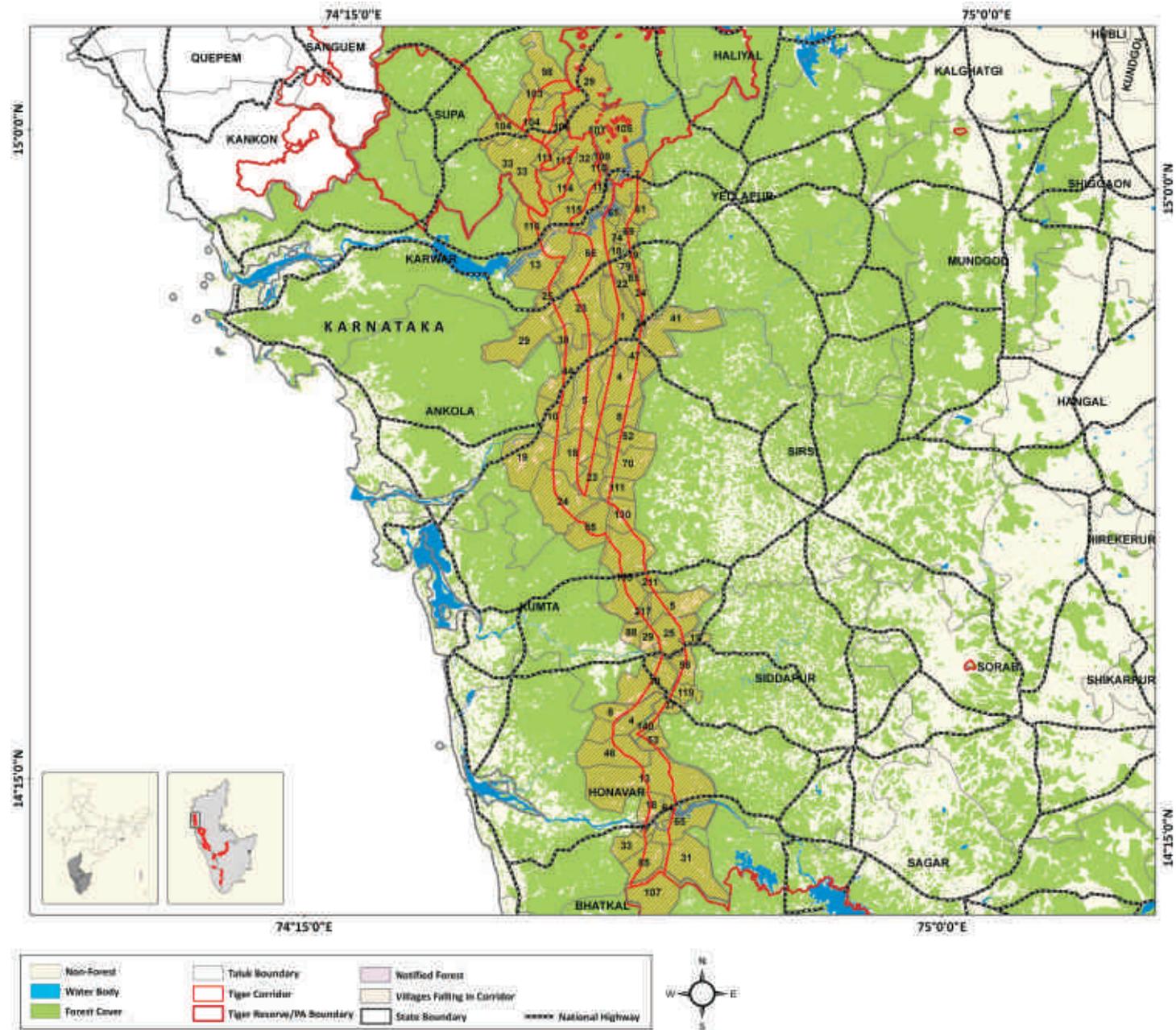


Figure 3.3:
Potential habitat connectivity for tiger movement between Anshi-Dandeli-Sharavathi Valley as depicted by CIRCUITSCAPE model



Figure 3.4:

Least Cost Pathway corridor for Tiger movement between Anshi-Dandeli-Sharavathi Valley overlaid with village map (the village numbers are referenced in Table 3.1)



| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-----------|----------|----------|-------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Karnataka | Karwar | Yellapur | Joglepal | 10 | 49 | 9 | 42 |
| 2 | | | Yellapur | Bare | 166 | 852 | 204 | 877 |
| 3 | | | Yellapur | Kattige | 82 | 415 | 419 | 1898 |
| 4 | | | Yellapur | Targar | 30 | 165 | 37 | 171 |
| 5 | | | Yellapur | Vajralli | 134 | 630 | 133 | 552 |
| 6 | | | Yellapur | Kodlagadde | 57 | 322 | 245 | 943 |
| 7 | | | Yellapur | Mavinamane | 342 | 1746 | 397 | 1748 |
| 8 | | | Yellapur | Gullapur | 175 | 773 | 226 | 893 |
| 9 | | | Yellapur | Bare | 166 | 852 | 204 | 877 |
| 10 | | | Yellapur | Kodlagadde | 57 | 322 | 245 | 943 |
| 11 | | | Yellapur | Bigar | 42 | 231 | 43 | 192 |
| 12 | | | Yellapur | Geral | 91 | 422 | 81 | 398 |
| 13 | | | Yellapur | Balagara | 134 | 759 | 143 | 627 |
| 14 | | | Yellapur | Barballi | 36 | 127 | Na | Na |
| 15 | | | Yellapur | Kalche | 268 | 1208 | 298 | 1075 |
| 16 | | | Yellapur | Baginakatte | 37 | 156 | 32 | 124 |
| 17 | | | Yellapur | Hongadde | 57 | 245 | 56 | 222 |
| 18 | | | Ankola | Shevkar | 63 | 420 | 73 | 448 |
| 19 | | | Ankola | Sunkasal | 208 | 966 | 229 | 930 |
| 20 | | | Ankola | Kodlagadde | 211 | 937 | 245 | 943 |
| 21 | | | Ankola | Halvalli | 307 | 1361 | 345 | 1461 |
| 22 | | | Ankola | Dongri | 127 | 635 | 145 | 660 |
| 23 | | | Ankola | Kammani | 38 | 168 | 54 | 217 |
| 24 | | | Ankola | Hebbul | 97 | 503 | 119 | 533 |
| 25 | | | Ankola | Kuntgani | 186 | 933 | 247 | 1030 |
| 26 | | | Ankola | Hillur | 512 | 2366 | 620 | 2499 |
| 27 | | | Ankola | Manigadde | 23 | 140 | 30 | 137 |
| 28 | | | Ankola | Achave | 406 | 1853 | 490 | 1969 |
| 29 | | | Ankola | Kalleshvar | NA | NA | NA | NA |
| 30 | | | Honavar | Hulegar | 284 | 1126 | 190 | 629 |

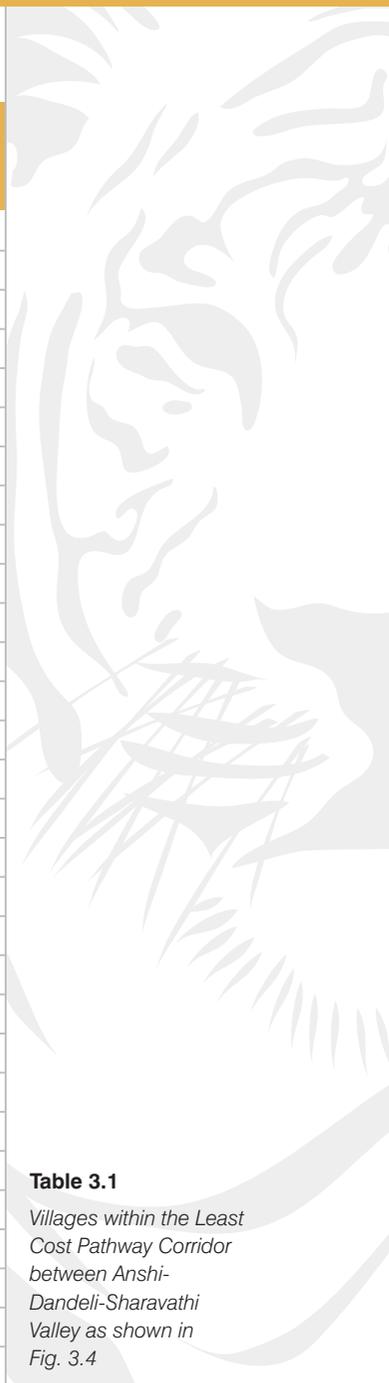


Table 3.1
Villages within the Least
Cost Pathway Corridor
between Anshi-
Dandeli-Sharavathi
Valley as shown in
Fig. 3.4

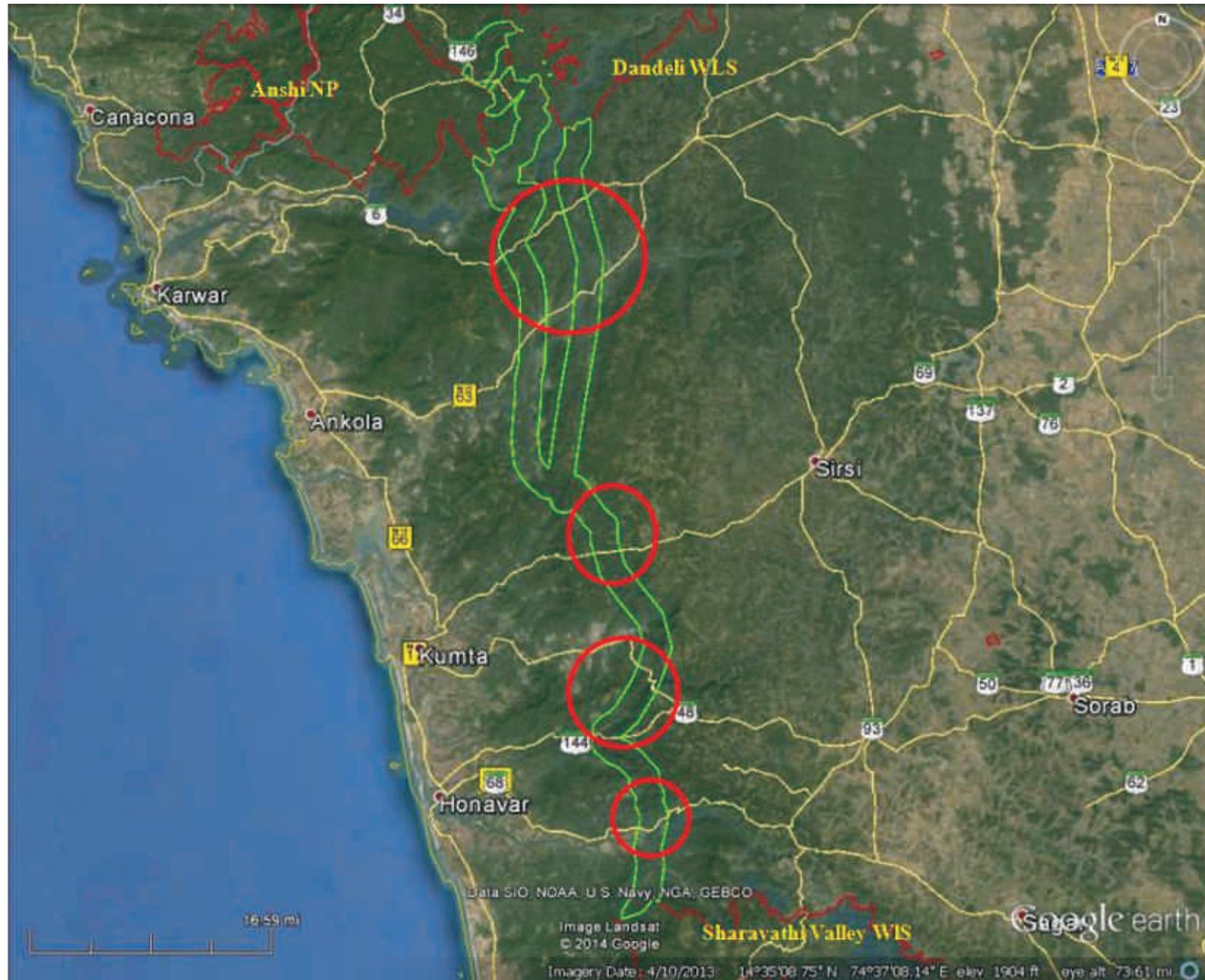
| Village_id | State | District | Tehsil | Village | No Of Household (2001) | Total Population (2001) | No Of Household (2011) | Total Population (2011) |
|------------|-------|----------|---------|----------------|------------------------|-------------------------|------------------------|-------------------------|
| 31 | | | Honavar | Jan | NA | NA | NA | NA |
| 32 | | | Honavar | Kabbinahakkal | NA | NA | NA | NA |
| 33 | | | Honavar | Heggargadde | NA | NA | NA | NA |
| 34 | | | Honavar | Hirebail | 200 | 937 | 268 | 1062 |
| 35 | | | Honavar | Hosgod | 40 | 229 | 52 | 264 |
| 36 | | | Honavar | Mahime | 505 | 2308 | 594 | 2685 |
| 37 | | | Honavar | Hadgeri | 79 | 348 | 93 | 389 |
| 38 | | | Honavar | Shirkur | 74 | 336 | 84 | 378 |
| 39 | | | Honavar | Nagarbastikere | 712 | 3476 | 787 | 3617 |
| 40 | | | Honavar | Kandoddi | 54 | 282 | 69 | 359 |
| 41 | | | Joida | Hebbal | 19 | 106 | 755 | 3833 |
| 42 | | | Joida | Bidoli | 57 | 264 | 71 | 296 |
| 43 | | | Joida | Amboli | 171 | 916 | 190 | 956 |
| 44 | | | Joida | Yarmukh | 98 | 432 | 99 | 413 |
| 45 | | | Joida | Chaper | 16 | 67 | 20 | 86 |
| 46 | | | Joida | Bhedasgadde | NA | NA | NA | NA |
| 47 | | | Joida | Kodagihittal | NA | NA | NA | NA |
| 48 | | | Joida | Shivapura | 46 | 200 | 9 | 33 |
| 49 | | | Joida | Tulasageri | 4 | 14 | 3 | 9 |
| 50 | | | Joida | Ulvi | 135 | 735 | 178 | 767 |
| 51 | | | Joida | Netragi | Na | Na | Na | Na |
| 52 | | | Joida | Kodatalli | Na | Na | Na | Na |
| 53 | | | Joida | Birkoi | 121 | 381 | 63 | 244 |
| 54 | | | Joida | Sulageri | NA | NA | NA | NA |
| 55 | | | Karwar | Devkar | 120 | 409 | 91 | 397 |
| 56 | | | Kumta | Medini | 47 | 254 | 64 | 268 |
| 57 | | | Kumta | Morse | 35 | 140 | 41 | 165 |
| 58 | | | Kumta | Bangane | 75 | 409 | 109 | 474 |
| 59 | | | Kumta | Yan | 94 | 427 | 125 | 495 |
| 60 | | | Kumta | Negalagone | NA | NA | NA | NA |

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-------|----------|----------|---------------|------------------------|-------------------------|------------------------|-------------------------|
| 61 | | Shimoga | Sagar | Uralagallu | 36 | 150 | 41 | 133 |
| 62 | | Karwar | Siddapur | Hallibail | 71 | 389 | 79 | 354 |
| 63 | | | Siddapur | Nilkund | 43 | 201 | 63 | 247 |
| 64 | | | Siddapur | Bilegod | 75 | 440 | 89 | 423 |
| 65 | | | Siddapur | Kodigadde | 60 | 301 | 83 | 372 |
| 66 | | | Siddapur | Hukkali | 31 | 173 | 49 | 201 |
| 67 | | | Siddapur | Gijagini | 51 | 303 | 67 | 324 |
| 68 | | | Siddapur | Niragod | 7 | 26 | 10 | 37 |
| 69 | | | Sirsi | Kelaginkeri | 68 | 377 | 84 | 385 |
| 70 | | | Sirsi | Mundaganamane | 122 | 555 | 128 | 588 |
| 71 | | | Sirsi | Hosur | 26 | 112 | 29255 | 116821 |
| 72 | | | Sirsi | Harsimane | 50 | 227 | 54 | 223 |
| 73 | | | Sirsi | Bengaon | 137 | 641 | 170 | 695 |
| 74 | | | Sirsi | Hebre | 207 | 957 | 229 | 947 |
| 75 | | | Sirsi | Bugadi | 5 | 14 | 5 | 27 |
| 76 | | | Joida | Gund | 67 | 321 | 64 | 300 |
| 77 | | | Joida | Bidoli | 57 | 264 | 71 | 296 |
| 78 | | | Joida | Shidoli | Na | Na | Na | Na |
| 79 | | | Joida | Amboli | 171 | 916 | 190 | 956 |
| 80 | | | Joida | Ambarade | NA | NA | NA | NA |



Figure 3.5:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Anshi-Dandeli-Sharavathi Valley



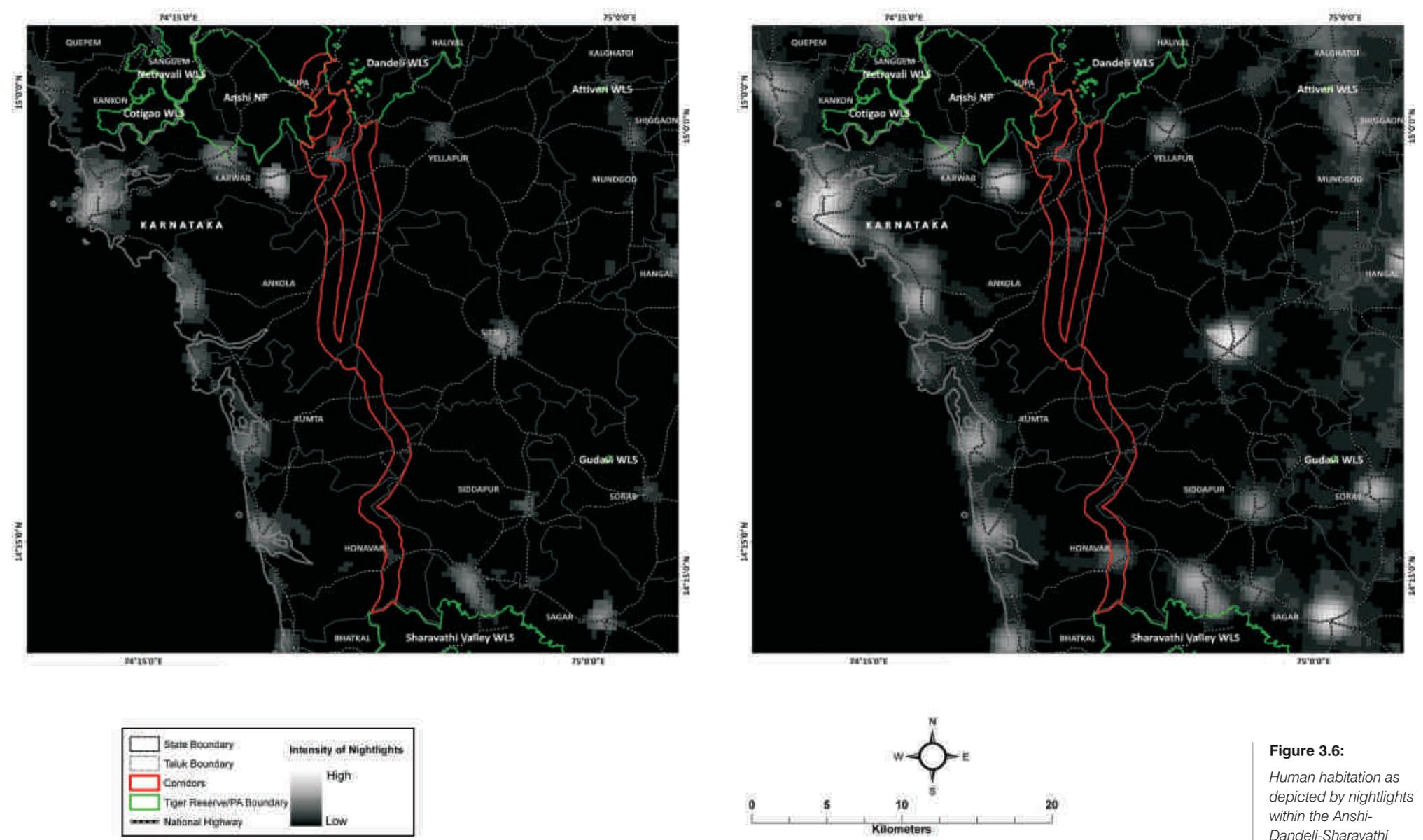


Figure 3.6:
Human habitation as depicted by nightlights within the Anshi-Dandeli-Sharavathi Valley landscape in the year 1992 and 2012



KUDREMUKH-BHADRA

This complex comprises of the central part of the Western Ghats in Karnataka and includes Kudremukh National Park and Bhadra Tiger Reserve. Kudremukh National Park is a proposed Tiger Reserve site and occupies parts of Karkala taluka in Udupi, Belthangadi taluka in Dakshin Kannada and Mudigere, Sringeri and Koppa taluka in Chikmagalur district. Immediately north of Kudremukh is Someshwara Wildlife Sanctuary while Shettihalli Wildlife Sanctuary is located north of Bhadra Tiger Reserve. While this region has relatively low abundance of tigers, the area holds good potential for tiger persistence. The tiger population in 2010 within this complex was estimated to be between 38 and 42 tigers with occupancy in an area of 4,258 km². The area occupied by tigers and the estimated tiger population within this landscape showed a decline in 2010 compared to 2006. The loss in tiger occupancy was observed in the forests south of Bhadra (Chikmagalur taluka), and south-west of Kudremukh (Belthangadi taluka). To the south of this tiger complex is the Nagarahole-Mudumalai-Wayanad complex, with small Protected Areas in-between such as Pushpagiri Wildlife Sanctuary and Talakaveri Wildlife Sanctuary connected with Brahmagiri Wildlife Sanctuary by Padinalknad and Kerti Reserved Forests. The intervening habitat matrix between the Protected Area complexes consist of plantations, agriculture and some scattered habitation along with other Reserved Forests such as Kabbinala, Kagneri and Kiribag. The corridor linkages identified within this landscape and between this landscape and tiger landscapes to the north and south by least cost pathways and Circuitscape flows are essential elements to ensure long term tiger persistence. Connectivity between the Protected Areas within the Kudremukh-Bhadra complex was patchy.

Kudremukh-Pushpagiri Corridor

| | |
|--------------------------|---|
| Habitat size | 40589 Km ² |
| Source Population | Kudremukh-Bhadra |
| Size of Source | 40 (38-42) tigers in 4258 Km ² |
| Protected Areas | Kudremukh WLS Pushpagiri WLS |
| Corridors | Kudremukh NP-Pushpagiri WLS |

Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor

| | |
|--------------------------|--|
| Habitat size | 40589 Km ² |
| Source Population | Kudremukh-Bhadra |
| Size of Source | 40 (38-42) in 4258 Km ² |
| Protected Areas | Kudremukh NP Someshwara WLS Bhadra WLS |
| Corridors | Kudremukh NP-Someshwara WLS Kudremukh NP-Bhadra WLS |

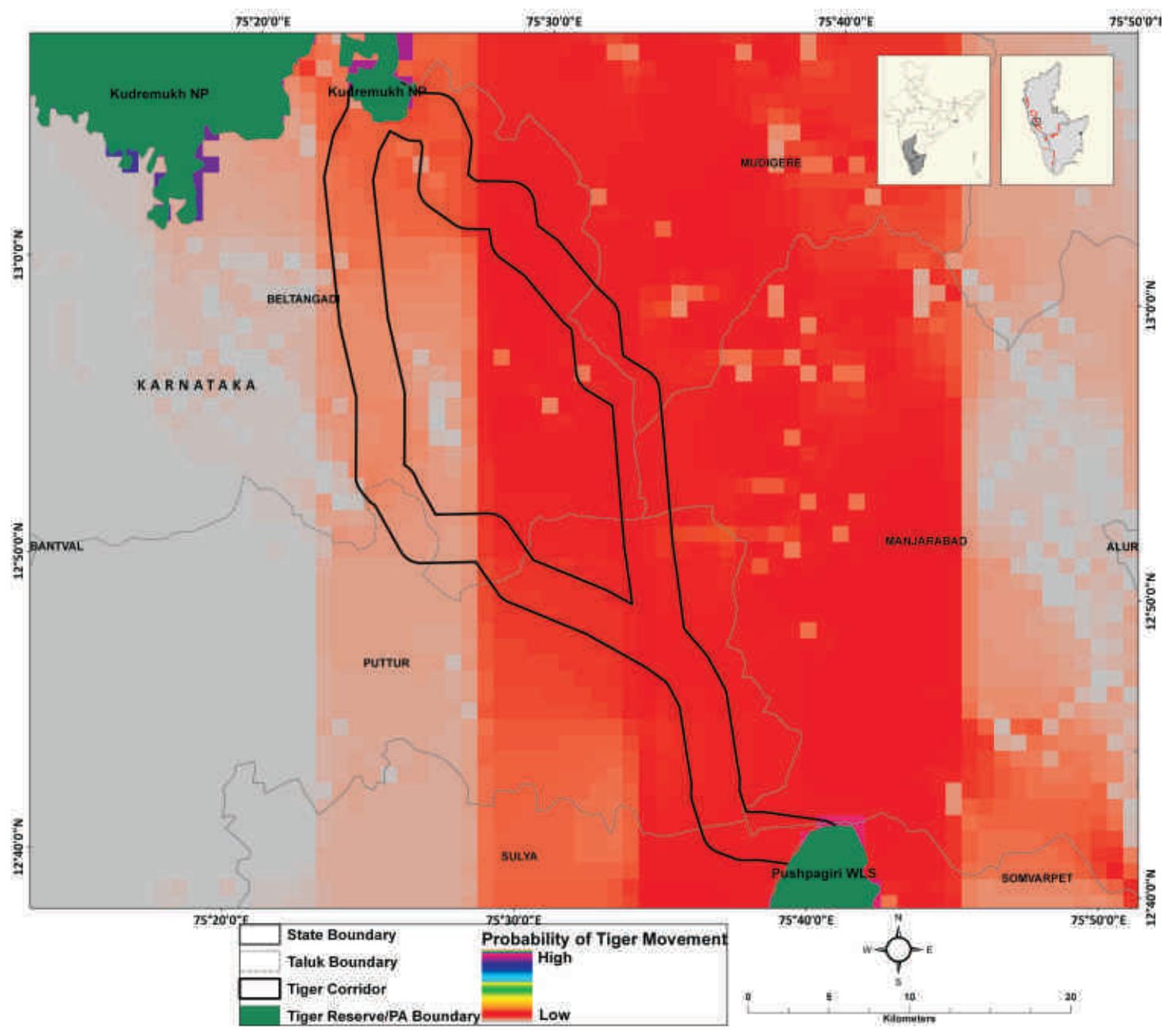
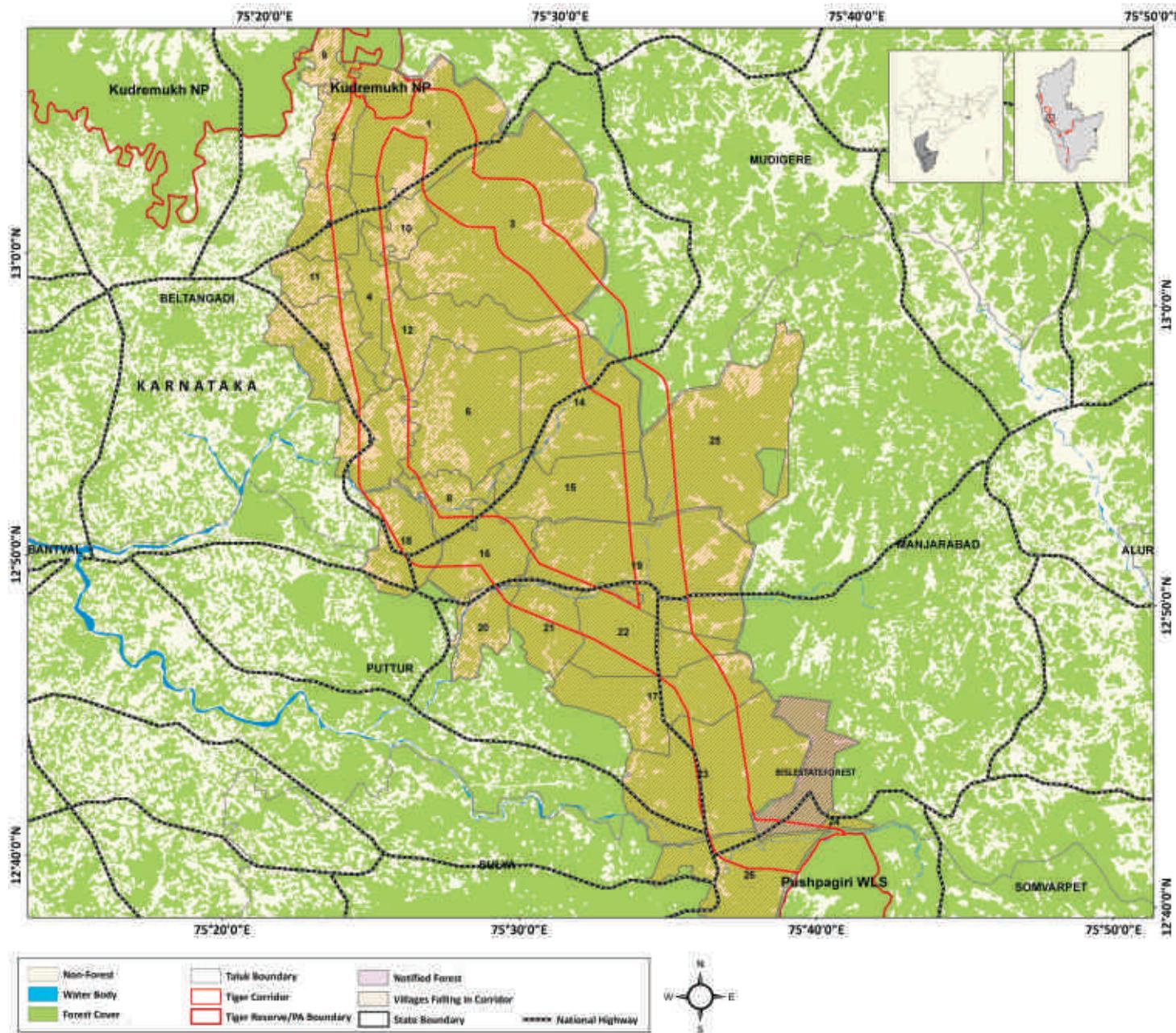


Figure 3.7:
 Potential habitat connectivity for tiger movement between Kudremukh-Pushpagiri Corridor as depicted by CIRCUITSCAPE model

Figure 3.8:

Least Cost Pathway corridor for tiger movement between Kudremukh-Pushpagiri overlaid with village map (the village numbers are referenced in Table 3.2)

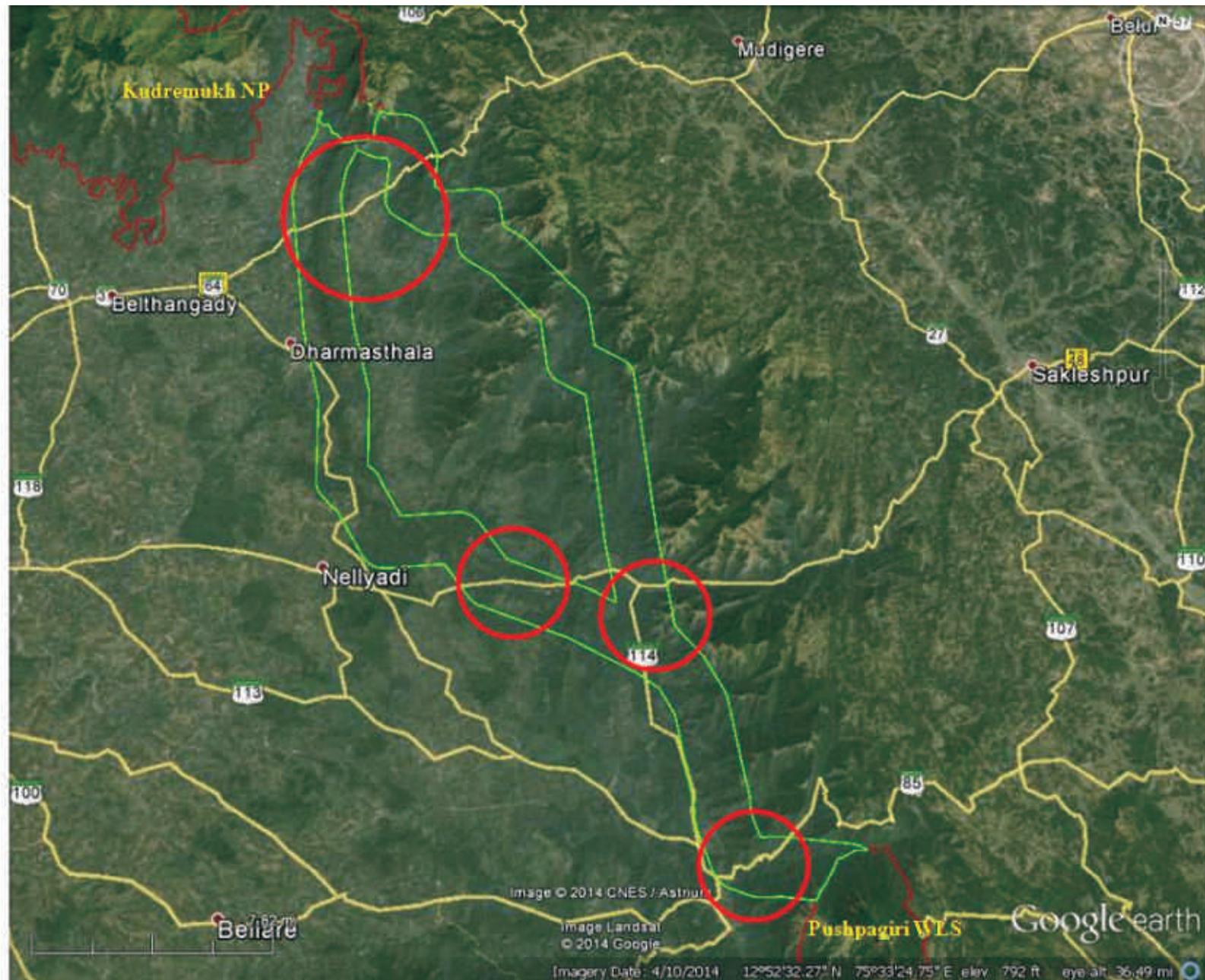


| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-----------|-----------|-------------|------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Karnataka | Mangalore | Belthangadi | Charmadi | 818 | 4668 | 977 | 5169 |
| 2 | | | Belthangadi | Kadirudyavara | 626 | 3360 | 737 | 3421 |
| 3 | | | Belthangadi | Neriya | 1213 | 6191 | 1394 | 6802 |
| 4 | | | Belthangadi | Chibidre | 360 | 2212 | 462 | 2372 |
| 5 | | | Belthangadi | Mundaje | 770 | 3804 | 903 | 4259 |
| 6 | | | Belthangadi | Kalanja | 907 | 4515 | 1057 | 4988 |
| 7 | | | Belthangadi | Nidle | 579 | 2905 | 667 | 3025 |
| 8 | | | Belthangadi | Hathyadka | 590 | 2835 | 629 | 2789 |
| 9 | | | Belthangadi | Mittabagilu | 613 | 3341 | 773 | 4002 |
| 10 | | | Belthangadi | Totatadi | 634 | 3222 | 750 | 3591 |
| 11 | | | Belthangadi | Kalmanja | 589 | 3192 | 771 | 3709 |
| 12 | | | Belthangadi | Puduvetta | 612 | 3060 | 731 | 3343 |
| 13 | | | Belthangadi | Dharmastala | 1868 | 9258 | 2181 | 9818 |
| 14 | | | Belthangadi | Shisla | 434 | 2070 | 471 | 2090 |
| 15 | | | Belthangadi | Shibaje Male | Na | Na | Na | Na |
| 16 | | | Belthangadi | Rekya | 450 | 2092 | 500 | 2079 |
| 17 | | | Puttur | Kombar | 525 | 2586 | 592 | 2684 |
| 18 | | | Puttur | Koukradi | 815 | 4281 | 1039 | 4916 |
| 19 | | | Puttur | Shiradi | 672 | 3164 | 746 | 2933 |
| 20 | | | Puttur | Nujibaltila | 682 | 3320 | 759 | 3278 |
| 21 | | | Puttur | Kenje | Na | Na | Na | Na |
| 22 | | | Puttur | Shirivagilu | 143 | 714 | 153 | 667 |
| 23 | | | Puttur | Bilenele | 740 | 3501 | 819 | 3580 |
| 24 | | Hassan | Sakaleshpur | Na | Na | Na | 82 | 335 |
| 25 | | | Sakaleshpur | Kumarhalli | Na | Na | Na | Na |
| 26 | | | Sakaleshpur | Bislestateforest | Na | Na | Na | Na |
| 27 | | Mangalore | Sulya | Subrahmanya | 810 | 3447 | 1012 | 4443 |

Table 3.2:
Villages within the Least
Cost Pathway Corridor
between Kudremukh-
Pushpagiri Valley as
shown in Fig. 3.8

Figure 3.9:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Kudremukh-Pushpagiri



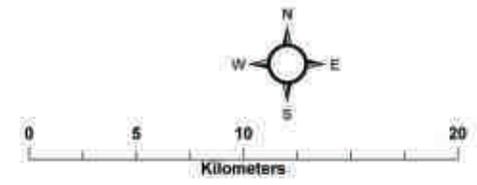
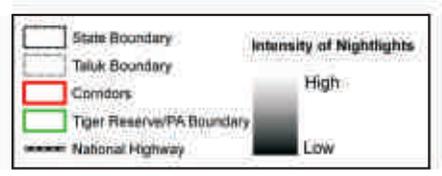
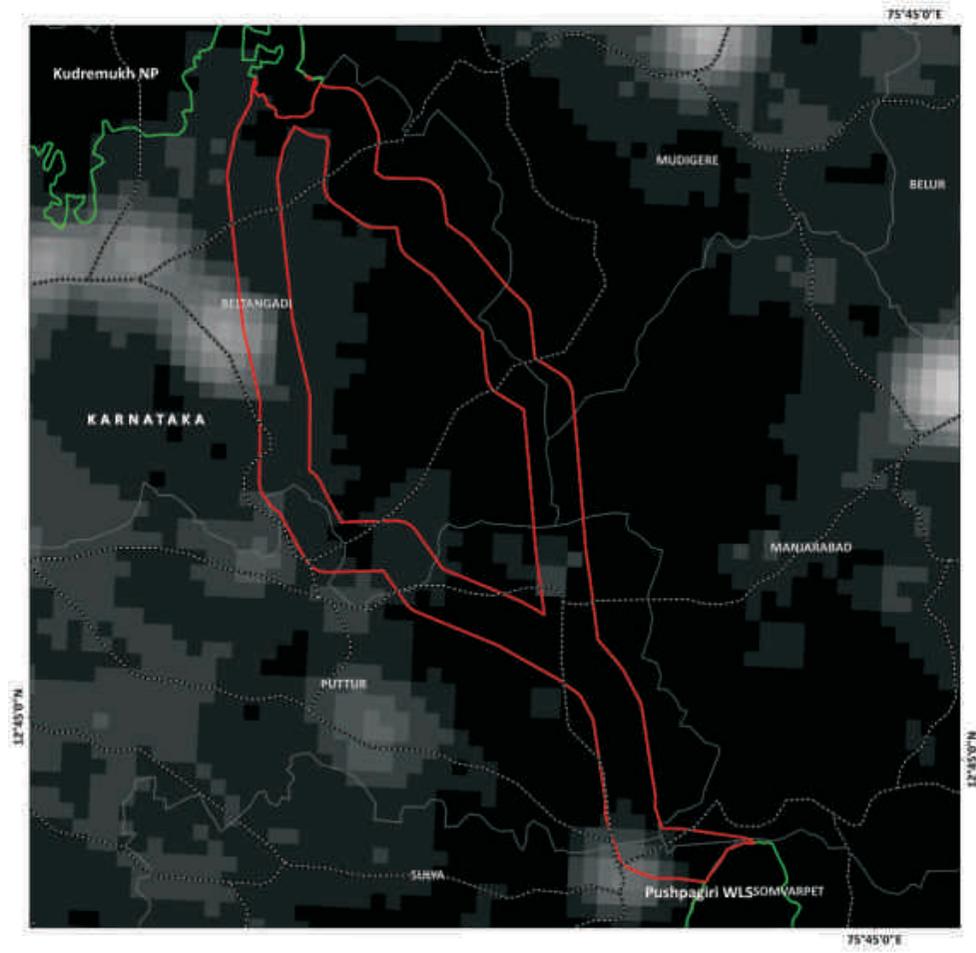
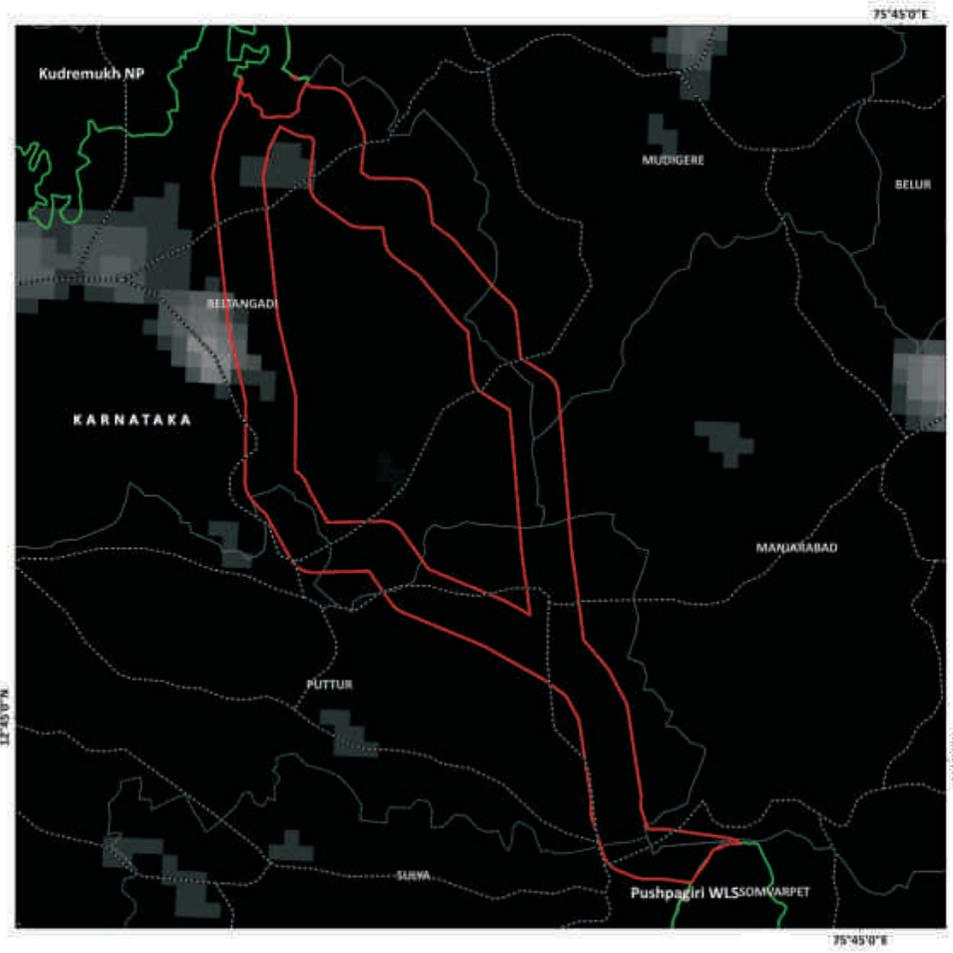
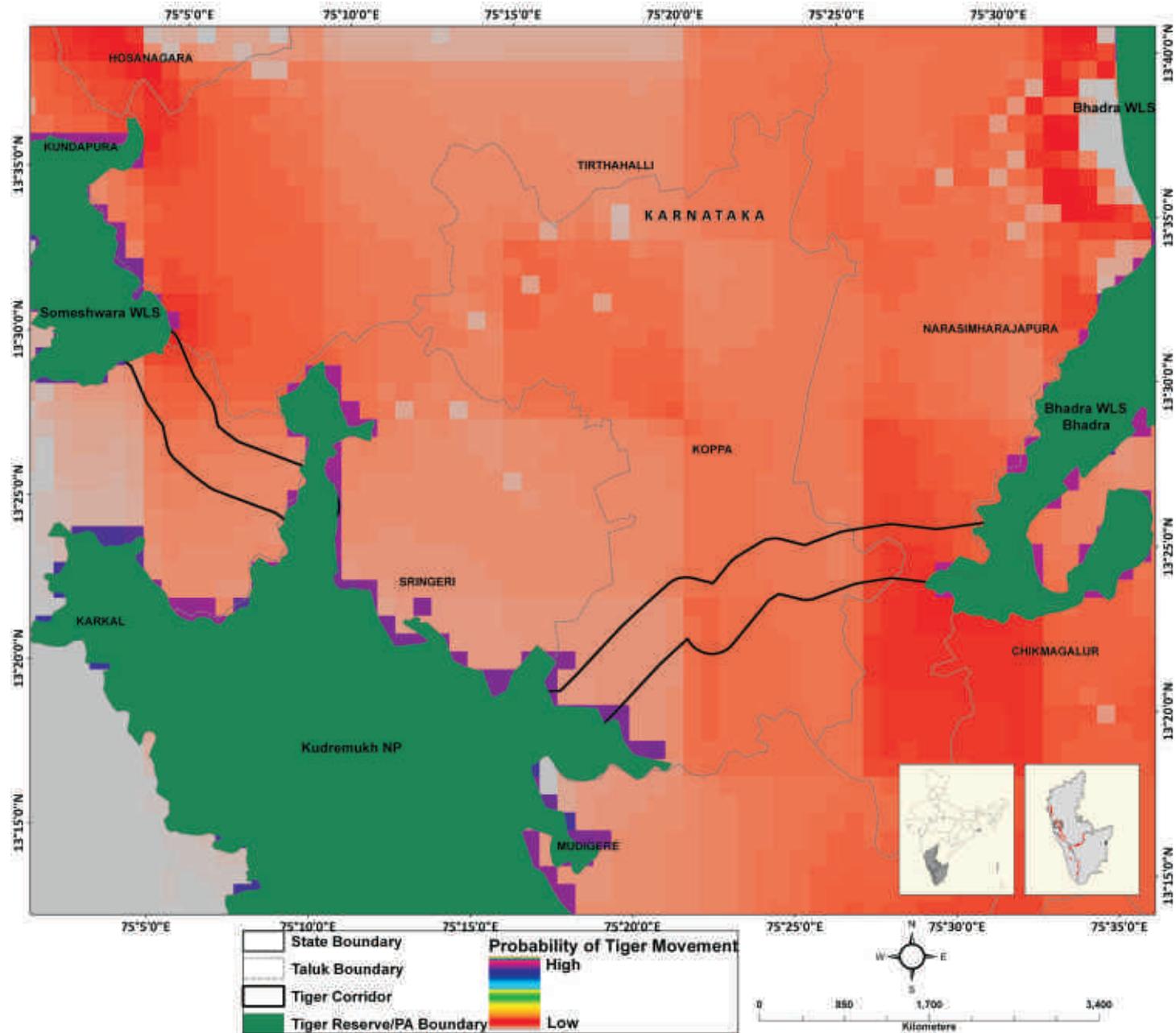


Figure 3.10:
Human habitation as depicted by nightlights within the Kudremukh-Pushpagiri Corridor landscape in the year 1992 and 2012

Figure 3.11:

Potential habitat connectivity for tiger movement between Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor as depicted by CIRCUITSCAPE model



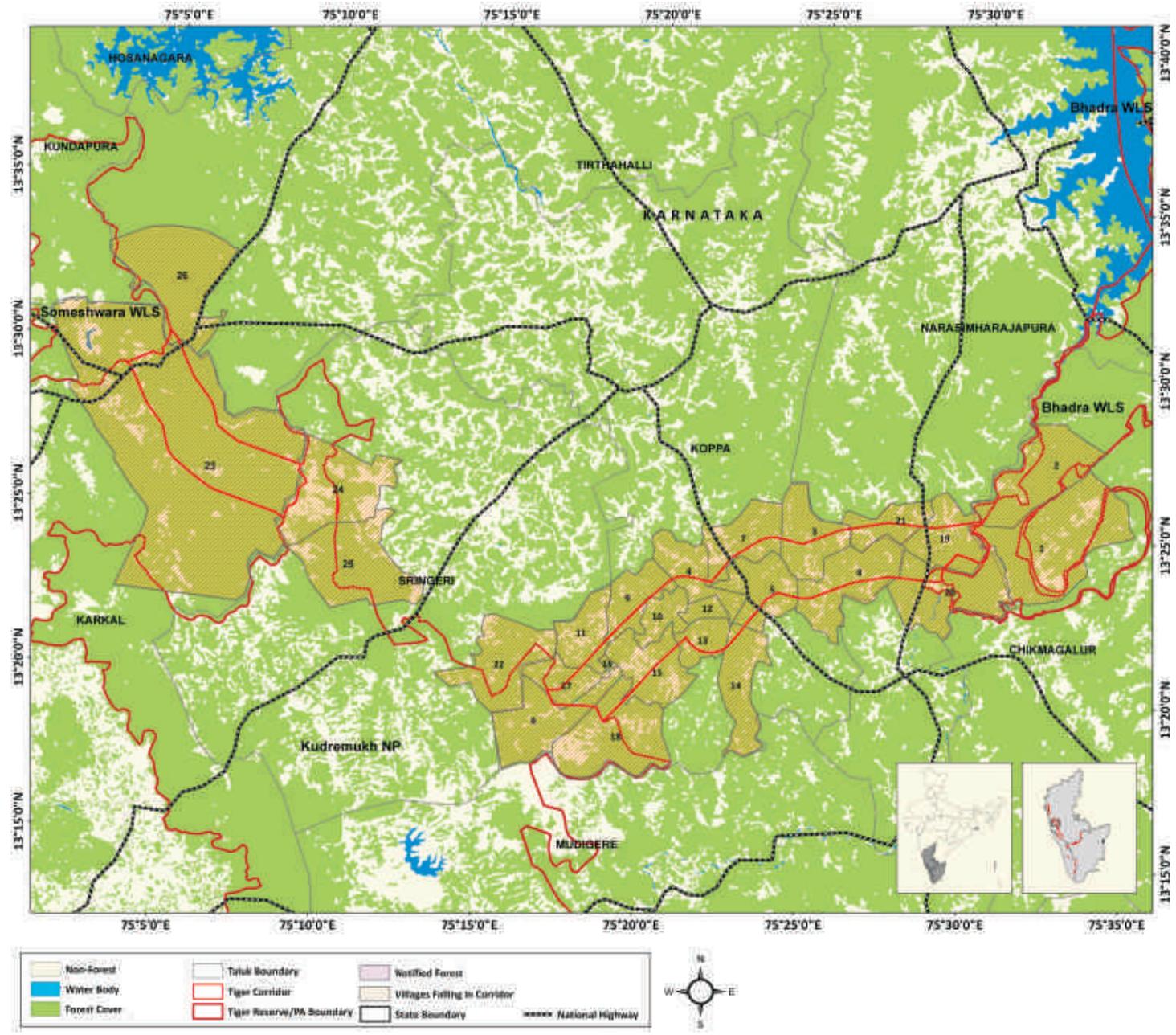


Figure 3.12:
Least Cost Pathway corridor for tiger movement between Someshwara WLS- Kudremukh NP-Bhadra WLS overlaid with village map (the village numbers are referenced in Table 3.3)

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-----------|-------------|--------------|-------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Karnataka | Chikmagalur | Chikmagalur | Bidare | 606 | 2727 | 557 | 2250 |
| 2 | | | Chikmagalur | Shirgota | 166 | 705 | 140 | 504 |
| 3 | | | Koppa | Hiregadde | 352 | 1551 | 24 | 101 |
| 4 | | | Koppa | Kulur | 402 | 1884 | 455 | 1874 |
| 5 | | | Koppa | Yelemadalu | 473 | 2094 | 527 | 2117 |
| 6 | | | Koppa | Megur | 106 | 568 | 104 | 527 |
| 7 | | | Koppa | Jayapur | 874 | 3696 | 917 | 3454 |
| 8 | | | Koppa | Adigebail | 560 | 2362 | 509 | 1943 |
| 9 | | | Koppa | Agalagundi | 247 | 1137 | 234 | 918 |
| 10 | | | Koppa | Hulagaradi | 121 | 562 | 111 | 486 |
| 11 | | | Koppa | Heggar | 172 | 784 | 150 | 641 |
| 12 | | | Koppa | Bachal Kan | Na | Na | Na | Na |
| 13 | | | Koppa | Guddetota | 264 | 1137 | 262 | 1053 |
| 14 | | | Koppa | Honnugundi | 289 | 1333 | 288 | 1350 |
| 15 | | | Koppa | Bhairadevar | 421 | 1809 | 439 | 1617 |
| 16 | | | Koppa | Na | Na | Na | 82 | 335 |
| 17 | | | Koppa | Harlane | 142 | 706 | 139 | 573 |
| 18 | | | Koppa | Kallugudda | 224 | 1088 | 249 | 1001 |
| 19 | | | N.r.pura | Kolhalli | Na | Na | 151 | 681 |
| 20 | | | N.r.pura | Maduguni | Na | Na | Na | Na |
| 21 | | | N.r.pura | Megaramakki | 155 | 690 | 187 | 710 |
| 22 | | | Sringeri | Malnadu | 130 | 731 | 157 | 742 |
| 23 | | Udupi | Karkal | Nadpal | 509 | 2578 | 563 | 2478 |
| 24 | | Chikmagalur | Sringeri | Rushyashringapura | 365 | 1588 | 394 | 1501 |
| 25 | | | Sringeri | Yedahalli | 240 | 1162 | 80 | 407 |
| 26 | | Shimoga | Thirthahalli | Agumbe | NA | NA | NA | NA |

Table 3.3:

Villages within the Least Cost Pathway Corridor between Someshwara WLS-Kudremukh NP-Bhadra WLS as shown in Fig. 3.12

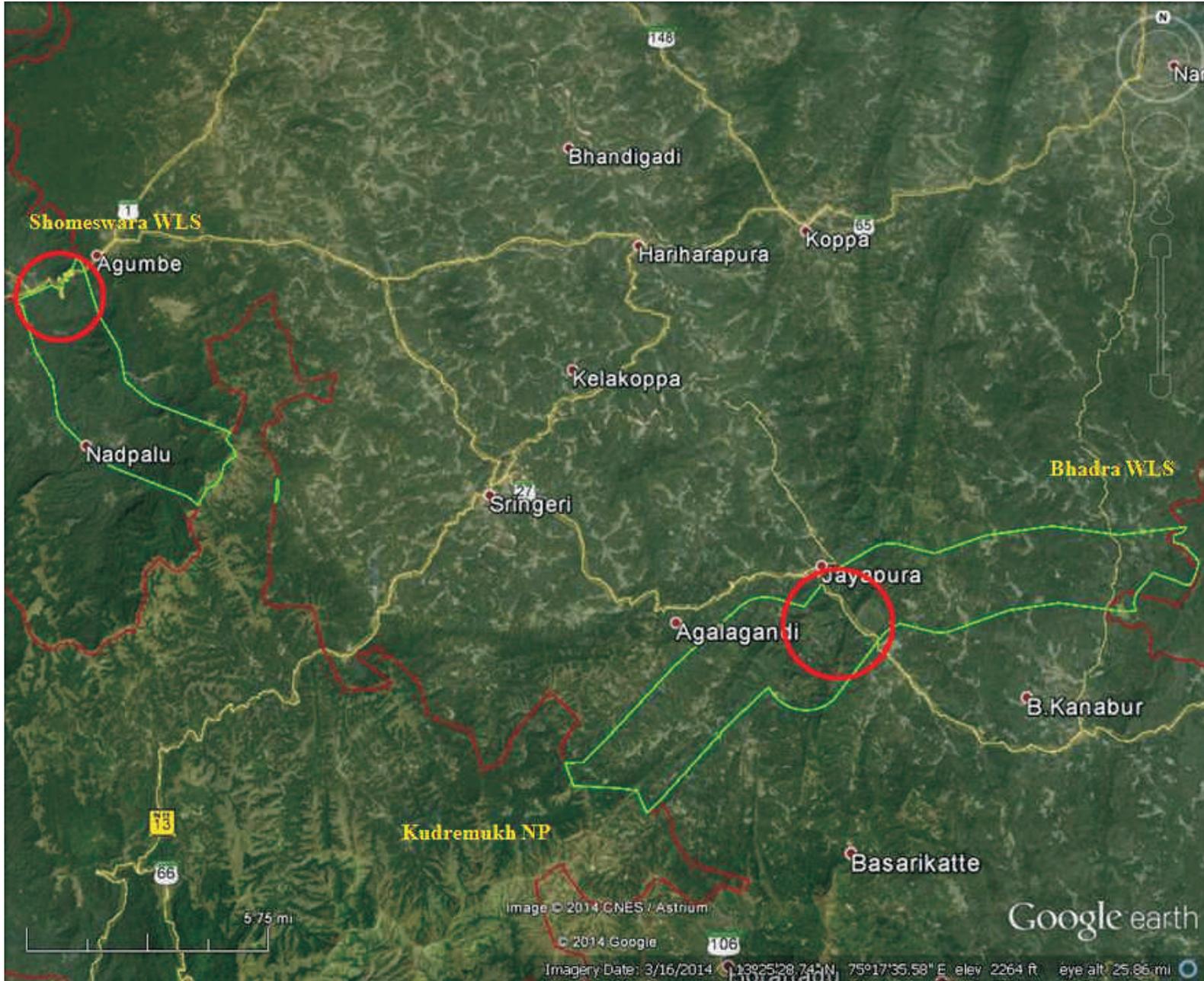
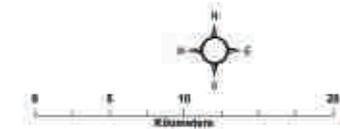
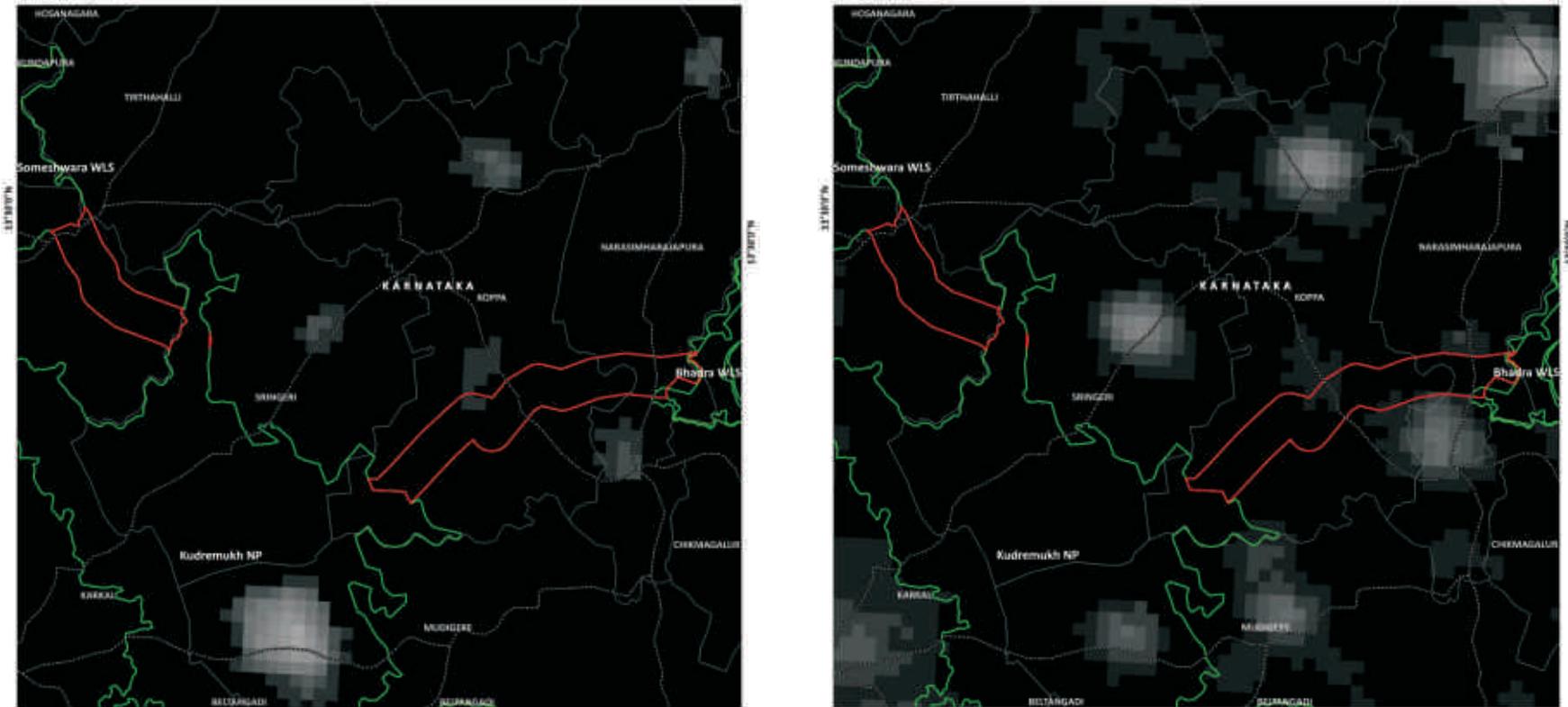


Figure 3.13:
 Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Someshwara WLS- Kudremukh NP-Bhadra WLS



Figure 3.14:

Human habitation as depicted by nightlights within the Someshwara WLS-Kudremukh NP-Bhadra WLS Corridor landscape in the year 1992



| Someshwara-Mookambika-Shettihalli WLS corridor | |
|---|--|
| Habitat size | 40589 Sq. Km |
| Source Population | Anshi NP Dandeli WLS |
| Size of Source | 39 (36-42) tigers in 4756 Sq. Km |
| Protected Areas | Someshwara WLS Mookambika WLS Shettihali WLS |
| Corridors | Someshwara WLS-Mookambika WLS Mookambika WLS-Shettihali WLS |

Mookambika Wildlife Sanctuary is connected to Someshwara Wildlife Sanctuary in the south through Reserved Forests of Hulikal, Varahi and Tombattu; which is further connected to Kudremukh National Park through contiguous forest. On the east, Mookambika Wildlife Sanctuary is poorly connected to Shettihali Wildlife Sanctuary through narrow ridge-top forests, the last part (8-10 km) of which traverses habitation and agriculture, with small patches of forests providing "stepping stone" connectivity.

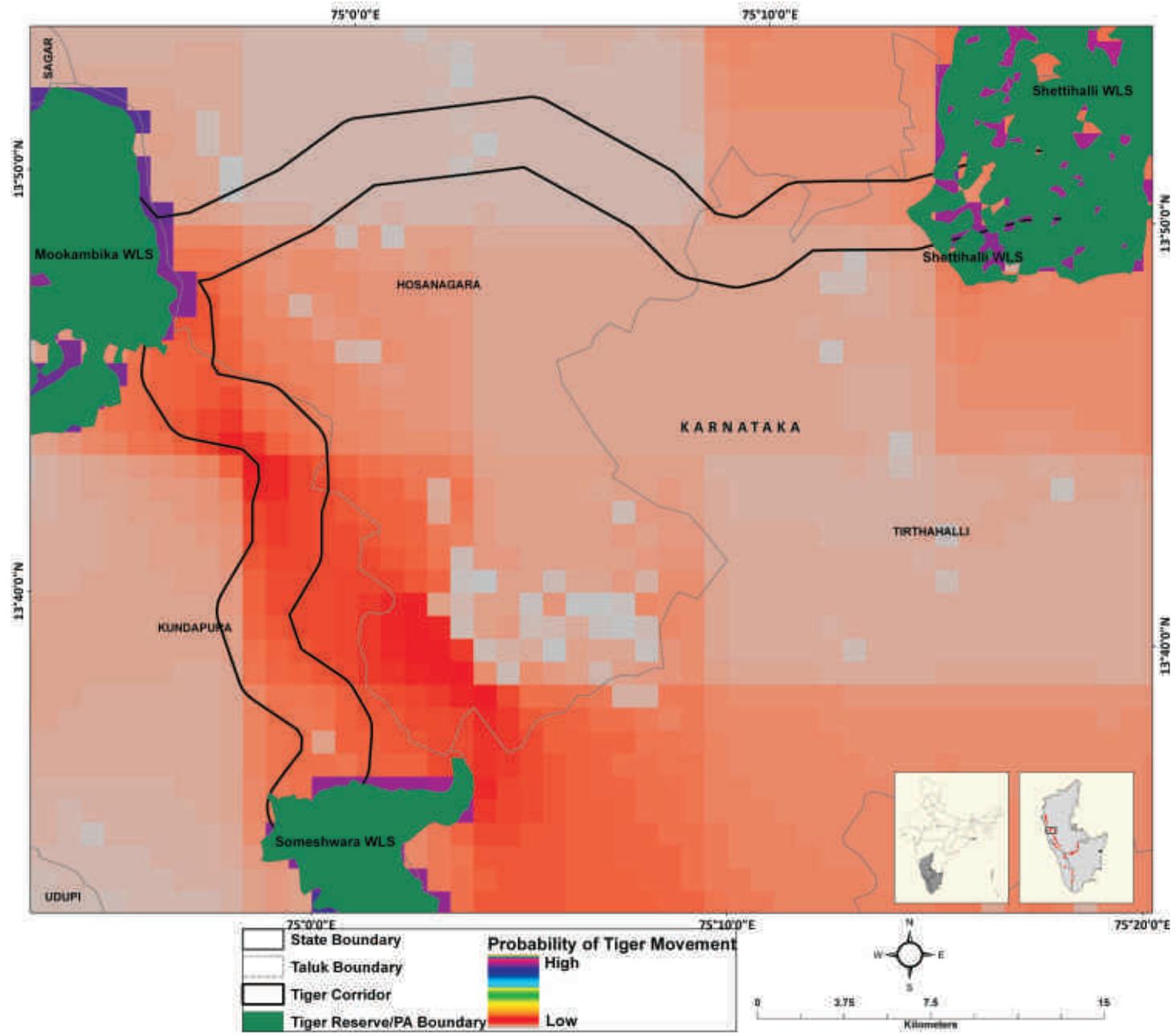
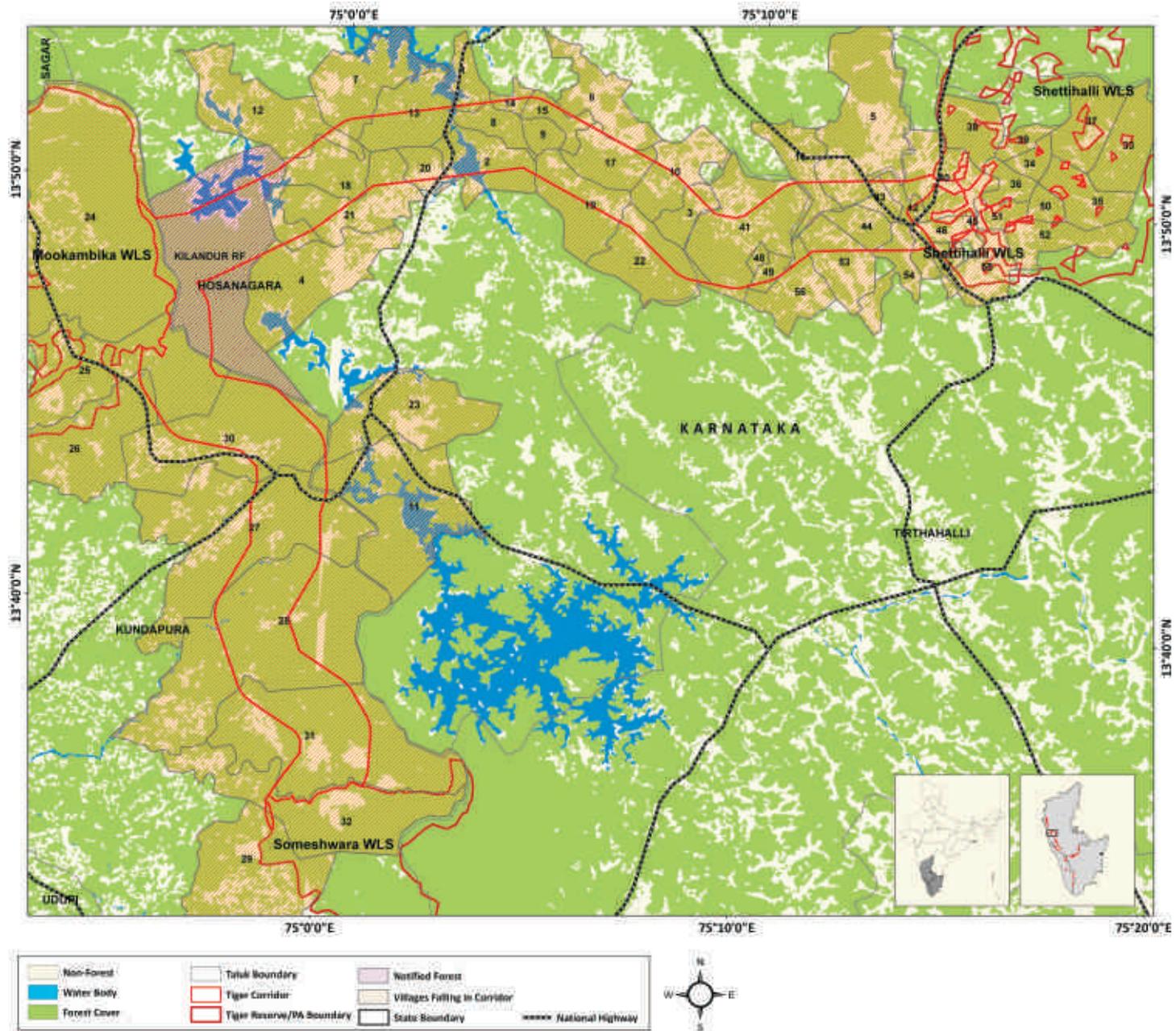


Figure 3.15:
Potential habitat connectivity for tiger movement between Someshwara-Mookambika-Shettihalli WLS corridor as depicted by CIRCUITSCAPE model

Figure 3.16:

Least Cost Pathway corridor for tiger movement between Someshwara-Mookambika-Shettihalli WLS overlaid with village map (the village numbers are referenced in Table 3.4)



| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-----------|----------|------------|--------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Karnataka | Shimoga | Hosanagara | Balekoppa | 26 | 200 | 43 | 207 |
| 2 | | | Hosanagara | Kodase | 52 | 260 | 66 | 255 |
| 3 | | | Hosanagara | Billodi | 89 | 384 | 96 | 438 |
| 4 | | | Hosanagara | Malali | 55 | 288 | 59 | 353 |
| 5 | | | Hosanagara | Malalikoppa | 83 | 436 | 96 | 446 |
| 6 | | | Hosanagara | Gorgodu | 161 | 858 | 204 | 954 |
| 7 | | | Hosanagara | Aramanekoppa | 218 | 1023 | 234 | 958 |
| 8 | | | Hosanagara | Haniya | 76 | 370 | 80 | 320 |
| 9 | | | Hosanagara | Nellunde | 40 | 199 | 50 | 197 |
| 10 | | | Hosanagara | Sonale | 229 | 1154 | 248 | 1134 |
| 11 | | | Hosanagara | Nidagodu | 154 | 692 | 266 | 1043 |
| 12 | | | Hosanagara | Mattikai | 166 | 753 | 193 | 766 |
| 13 | | | Hosanagara | Brahmanataruve | 85 | 384 | 102 | 369 |
| 14 | | | Hosanagara | Kukkodagasaramane | 112 | 488 | 140 | 501 |
| 15 | | | Hosanagara | Ramachandrapur | 117 | 617 | 38 | 121 |
| 16 | | | Hosanagara | Honnebailu | 211 | 1034 | 228 | 883 |
| 17 | | | Hosanagara | Trineve | 188 | 924 | 202 | 916 |
| 18 | | | Hosanagara | Brahmanvad | 95 | 443 | 114 | 494 |
| 19 | | | Hosanagara | Togare | 142 | 705 | 152 | 637 |
| 20 | | | Hosanagara | Basavanbyana | 49 | 245 | 55 | 262 |
| 21 | | | Hosanagara | Baise | 183 | 886 | 208 | 961 |
| 22 | | | Hosanagara | Kalluvidiabbigalla | 97 | 462 | 114 | 417 |
| 23 | | | Hosanagara | Kairakunda | 732 | 3001 | 475 | 1704 |
| 24 | | Udupi | Kundapura | Muduru | 660 | 3033 | 694 | 2973 |
| 25 | | | Kundapura | Halihole | 443 | 2460 | 495 | 2328 |
| 26 | | | Kundapura | Bellal | 499 | 2728 | 552 | 2780 |
| 27 | | | Kundapura | Hosangadi | 1040 | 4972 | 1131 | 4872 |
| 28 | | | Kundapura | Machattu | 456 | 2722 | 532 | 2616 |
| 29 | | | Kundapura | Shedimane | 413 | 2023 | 492 | 2370 |
| 30 | | | Kundapura | Yedamoge | NA | NA | NA | NA |

Table 3.4:
Villages within the Least
Cost Pathway Corridor
between Someshwara-
Mookambika-Shettihalli
WLS as shown in
Fig. 3.16

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-------|----------|--------------|-----------------|------------------------|-------------------------|------------------------|-------------------------|
| 31 | | | Kundapura | Amasebail | 524 | 2654 | 614 | 3034 |
| 32 | | | Kundapura | Samshe | NA | NA | NA | NA |
| 33 | | Shimoga | Thirthahalli | Vatigar | 55 | 263 | 60 | 255 |
| 34 | | | Thirthahalli | Hire Kallahalli | 29 | 163 | 33 | 142 |
| 35 | | | Thirthahalli | Torebail | 87 | 411 | 108 | 459 |
| 36 | | | Thirthahalli | Chik Kallahalli | 54 | 348 | 73 | 315 |
| 37 | | | Thirthahalli | Alur | 99 | 499 | 3 | 13 |
| 38 | | | Thirthahalli | Kesare | 123 | 497 | 109 | 417 |
| 39 | | | Thirthahalli | Umblebailu | 8 | 37 | 9 | 38 |
| 40 | | | Thirthahalli | Muniyur | 277 | 1273 | 308 | 1414 |
| 41 | | | Thirthahalli | Shankarapura | 245 | 1168 | 19 | 72 |
| 42 | | | Thirthahalli | Mandaka | 18 | 62 | 18 | 62 |
| 43 | | | Thirthahalli | Shankarahalli | 36 | 207 | 41 | 209 |
| 44 | | | Thirthahalli | Hosakoppa | 39 | 210 | 14 | 66 |
| 45 | | | Thirthahalli | Karekoppa | 6 | 25 | 221 | 947 |
| 46 | | | Thirthahalli | Hadigallu | 179 | 839 | 271 | 1078 |
| 47 | | | Thirthahalli | Halavanahalli | 60 | 274 | 63 | 237 |
| 48 | | | Thirthahalli | Balagodu | 26 | 100 | 32 | 108 |
| 49 | | | Thirthahalli | Aralasurali | 109 | 508 | 130 | 460 |
| 50 | | | Thirthahalli | Bidi | 15 | 78 | 1025 | 4445 |
| 51 | | | Thirthahalli | Melina Kadkod | 36 | 181 | 41 | 178 |
| 52 | | | Thirthahalli | Demalapura | 158 | 688 | 188 | 767 |
| 53 | | | Thirthahalli | Malleswara | 188 | 935 | 351 | 1498 |
| 54 | | | Thirthahalli | Kardiga | 135 | 670 | 178 | 727 |
| 55 | | | Thirthahalli | Konanduru | 883 | 4009 | 996 | 3973 |
| 56 | | | Thirthahalli | Siragaru | 274 | 1217 | 296 | 1210 |

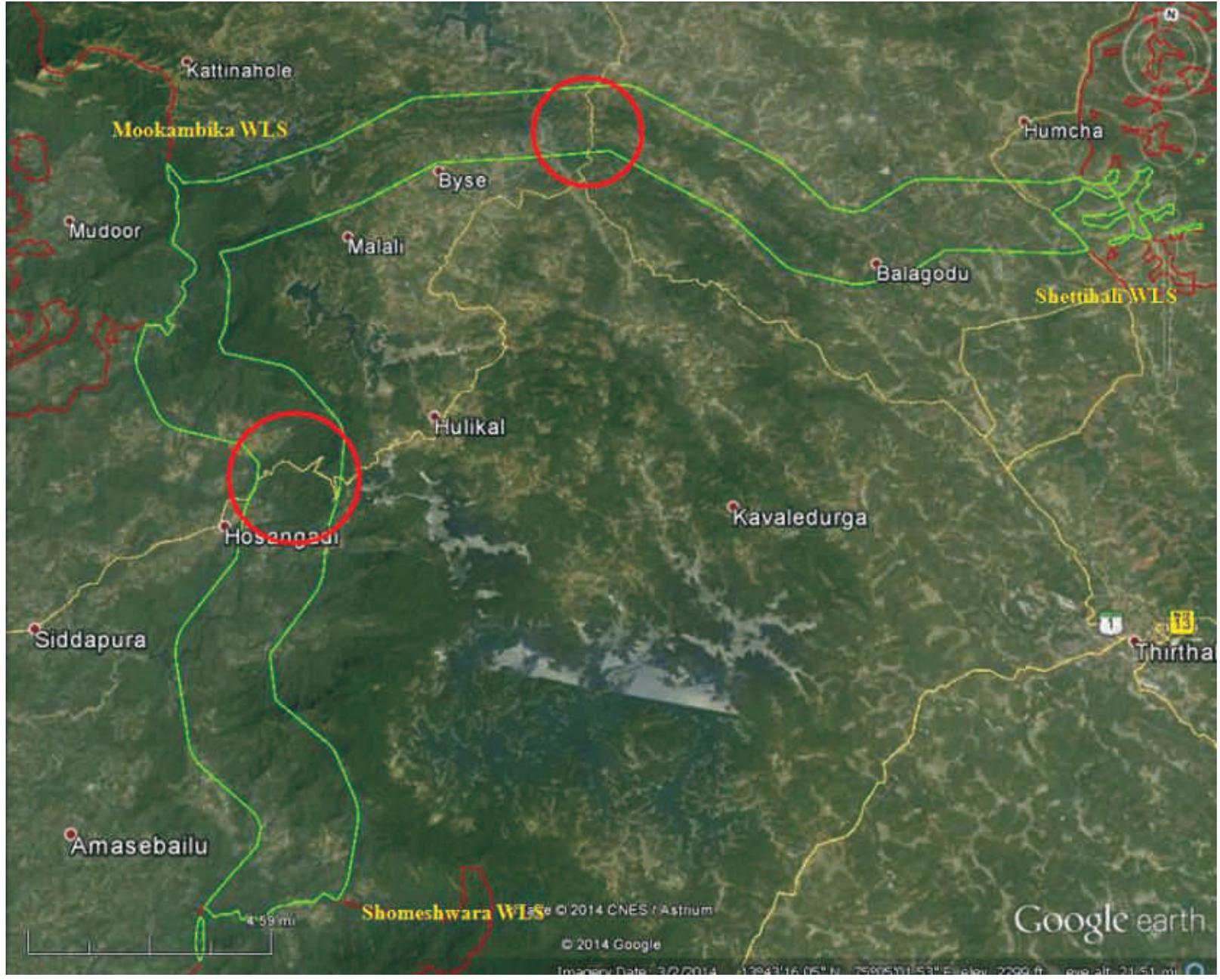
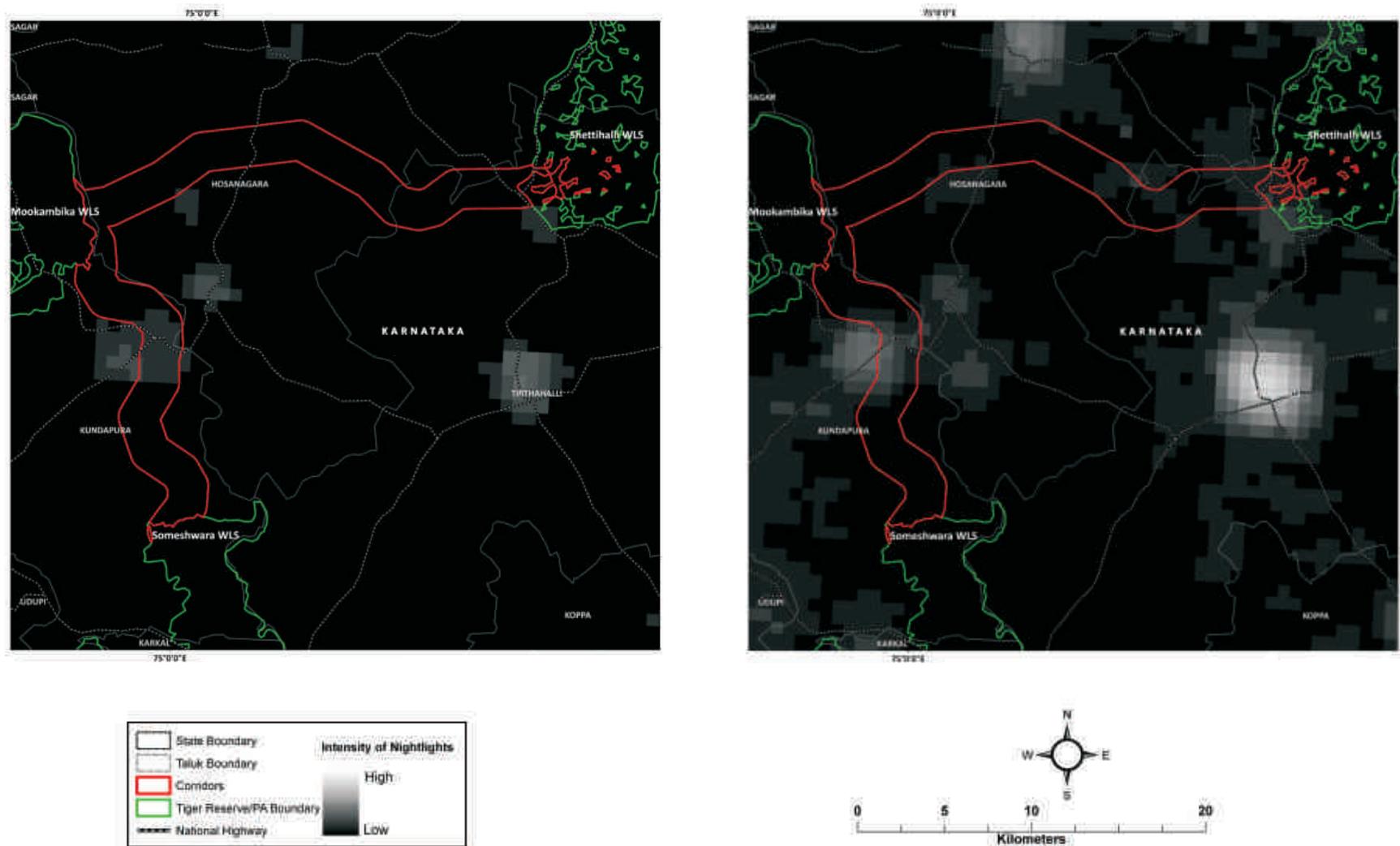


Figure 3.17:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Someshwara-Mookambika-Shettihalli WLS

Figure 3.18:

Human habitation as depicted by nightlights within the Someshwara-Mookambika-Shettihalli WLS Corridor landscape in the year 1992



The Reserved Forests of Northern Cardamom Hills, Choranyedahalli, Kakanhosudi and Tamadihalli connect Shettihalli Wildlife Sanctuary to the northern parts of Bhadra Tiger Reserve. While this habitat matrix is permeable for wildlife movement, it is dotted with few agricultural developments which could grow into barriers at a later date. Connectivity to the southern portion of Bhadra with Shettihalli was only through ridge top forests and at risk of being broken at some places by agriculture development. Habitat matrix intervening Bhadra Tiger Reserve and Kudremukh National Park was conducive for movement of tigers and their prey, but designating a formal corridor within this matrix would ensure this connectivity for the future.

Bhadra-Shettihalli WLS Corridor

| | |
|--------------------------|--|
| Habitat size | 40589 Km ² |
| Source Population | Kudremukh-Bhadra |
| Size of Source | 40 (38-42) tigers in 4258 Km ² |
| Protected Areas | Bhadra WLS Shettihali WLS |
| Corridors | Shettihali WLS-Bhadra WLS 1 Shettihali WLS-Bhadra WLS 2 |

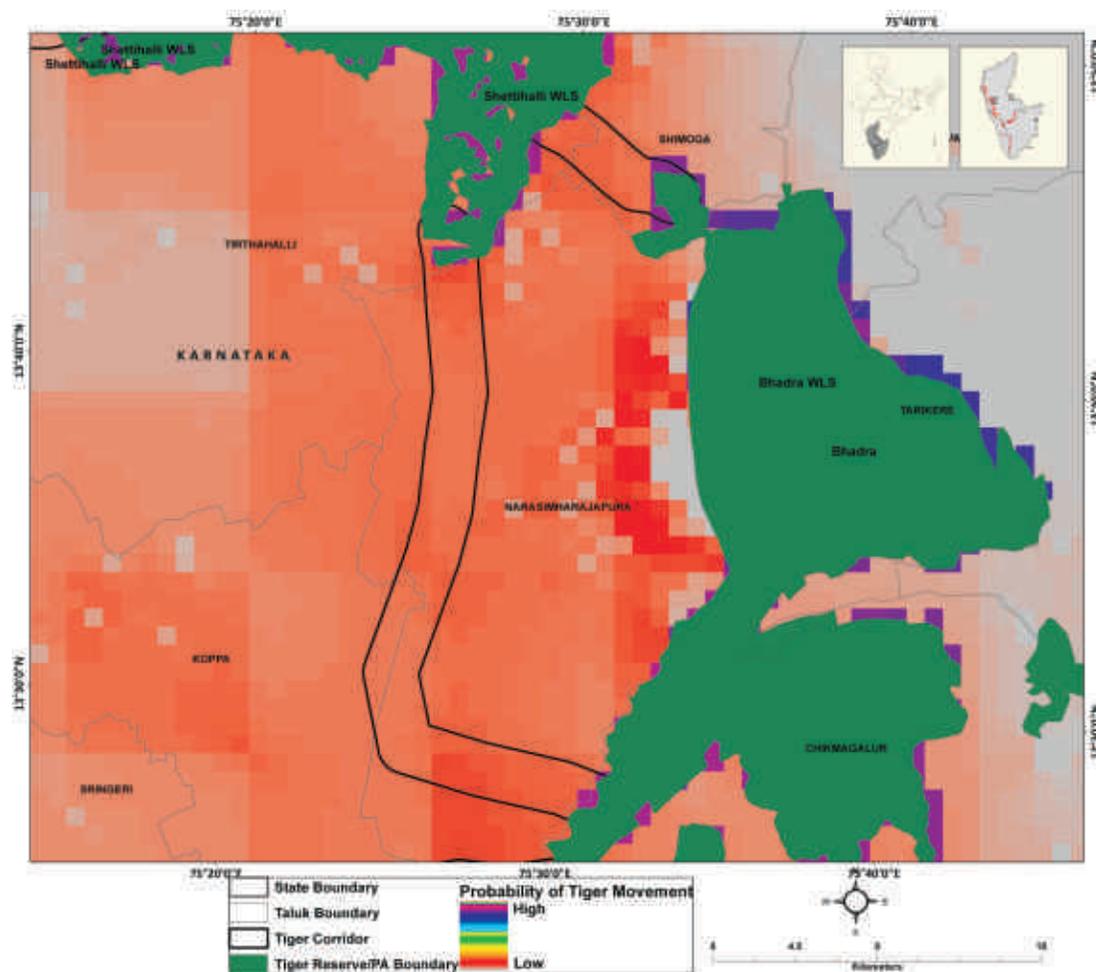
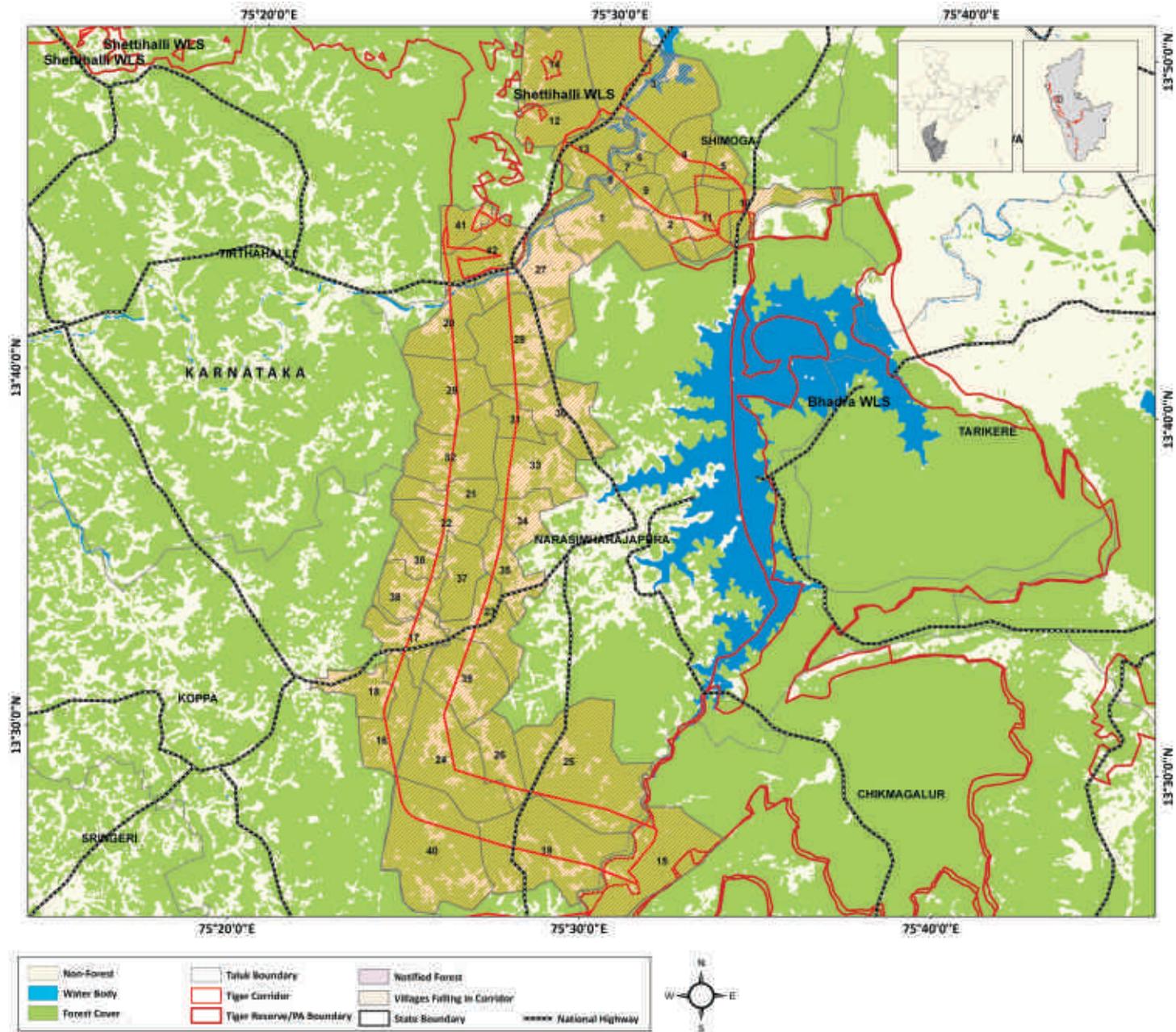


Figure 3.19:
Potential habitat connectivity for tiger movement between Bhadra-Shettihalli WLS Corridor as depicted by CIRCUITSCAPE model

Figure 3.20:

Least Cost Pathway corridor for tiger movement between Bhadra-Shettihalli WLS overlaid with village map (the village numbers are referenced in Table 3.5)



| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-----------|-------------|-------------------|-------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Karnataka | Chikmagalur | N.R.Pura | Kanaburu | NA | NA | NA | NA |
| 2 | | Shimoga | Shimoga | Lingapura | 2 | 8 | 174 | 895 |
| 3 | | | Shimoga | Sakrebailu | 6 | 32 | 11 | 49 |
| 4 | | | Shimoga | Kaitotlu | 64 | 316 | 55 | 241 |
| 5 | | | Shimoga | Sarigere | 29 | 139 | 30 | 123 |
| 6 | | | Shimoga | Chitemane | NA | NA | NA | NA |
| 7 | | | Shimoga | Naldlle | NA | NA | NA | NA |
| 8 | | | Shimoga | Billigalu | 340 | 1681 | 190 | 852 |
| 9 | | | Shimoga | Siddammaji Hosuru | 40 | 160 | 40 | 162 |
| 10 | | | Shimoga | Bairapura | Na | Na | 47 | 196 |
| 11 | | | Shimoga | Kakanhosudi | 95 | 440 | 105 | 392 |
| 12 | | | Thirthahalli | Talale | 57 | 262 | 201 | 929 |
| 13 | | | Thirthahalli | Bommanahalli | 5 | 21 | 253 | 1372 |
| 14 | | | Thirthahalli | Kigadi | 86 | 357 | 84 | 312 |
| 15 | | Chikmagalur | Chikmagalur | Shirgota | 166 | 705 | 140 | 504 |
| 16 | | | Koppa | Nuggi | 444 | 1980 | 449 | 1693 |
| 17 | | | Koppa | Talamakki | 332 | 1609 | 442 | 1703 |
| 18 | | | Koppa | Bintaravalli | 477 | 2256 | 721 | 3029 |
| 19 | | | N.R.Pura | Adavalli | Na | Na | 75 | 314 |
| 20 | | | Narasimharajapura | Konakere | 103 | 558 | 127 | 502 |
| 21 | | | Narasimharajapura | Bellur | 87 | 372 | 151 | 615 |
| 22 | | | Narasimharajapura | Konodi | 161 | 742 | 176 | 679 |
| 23 | | | Narasimharajapura | Sankse | 205 | 892 | 211 | 855 |
| 24 | | | Narasimharajapura | Haravari | 371 | 1588 | 413 | 1590 |
| 25 | | | Narasimharajapura | Alehalli | 156 | 618 | 149 | 536 |
| 26 | | | Narasimharajapura | Davana | 119 | 552 | 140 | 512 |
| 27 | | | N.R.Pura | Muttinakoppa | NA | NA | NA | NA |
| 28 | | | N.R.Pura | Madaburu | NA | NA | NA | NA |
| 29 | | | N.R.Pura | Malandur | NA | NA | NA | NA |
| 30 | | | N.R.pura | Kadabinabail | NA | NA | NA | NA |

Table 3.5:
Villages within the Least Cost Pathway Corridor between Bhadra-Shettihalli WLS as shown in Fig. 3.20

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|-------|----------|--------------|-------------|------------------------|-------------------------|------------------------|-------------------------|
| 31 | | | N.R.Pura | Neralakoppa | NA | NA | 8 | 41 |
| 32 | | | N.R.Pura | Hatur | NA | NA | NA | NA |
| 33 | | | N.R.Pura | Badagabail | NA | NA | NA | NA |
| 34 | | | N.R.Pura | Simmase | NA | NA | NA | NA |
| 35 | | | N.R.Pura | Gubbaga | NA | NA | NA | NA |
| 36 | | | N.R.Pura | Kamalapur | NA | NA | NA | NA |
| 37 | | | N.R.Pura | Sedgaru | NA | NA | 65 | 274 |
| 38 | | | N.R.Pura | Situr | NA | NA | NA | NA |
| 39 | | | N.R.Pura | Kanuru | NA | NA | 250 | 1048 |
| 40 | | | N.R.Pura | Karkeshvar | NA | NA | NA | NA |
| 41 | | Shimoga | Thirthahalli | Hemmakki | 87 | 403 | 407 | 1707 |
| 42 | | Shimoga | Thirthahalli | Lingapur | 437 | 2028 | 191 | 1002 |



Figure 3 21:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bhadra-Shettihalli WLS

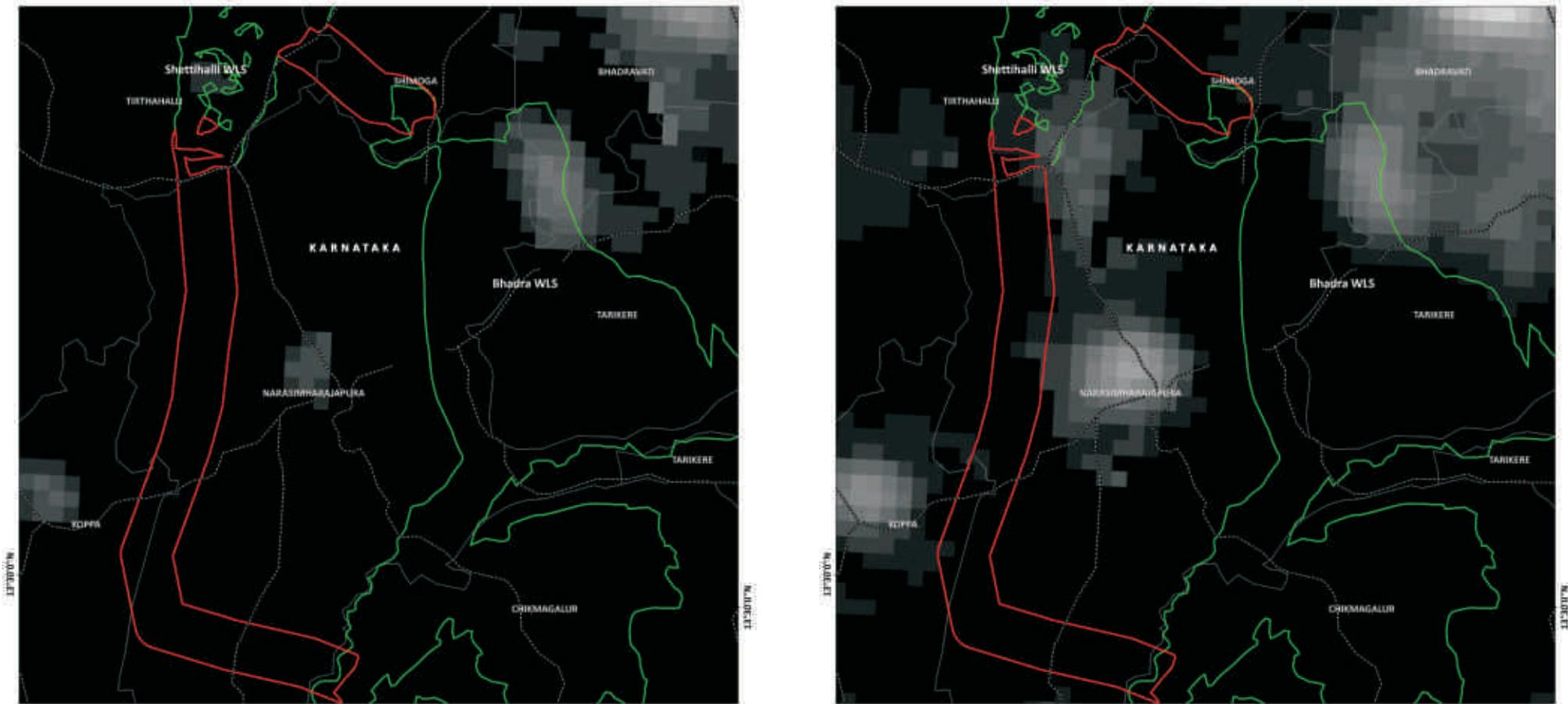
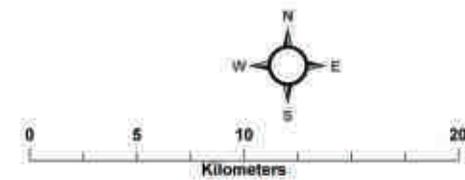


Figure 3.22:
Human habitation as depicted by nightlights within the Bhadra-Shettihalli WLS landscape in the year 1992 and 2012



The connectivity to the south from Kudremukh National Park to Pushpagiri Wildlife Sanctuary, and then directly onto Nagarahole National Park and to Wayanad Tiger Reserve (Kerala) via Talakaveri Wildlife Sanctuary and Brahmagiri Wildlife Sanctuary is one of the most precarious corridor systems within the Western Ghats. The connectivity of Kudremukh-Bhadra complex to the Nagarahole-Bandipur-Mudumalai-Wayanad complex via the western corridor system (Pushpagiri-Talakaveri-Brahmagiri) as well as the direct connectivity to Nagarahole showed tiger presence suggestive of viable corridors systems. The western corridor is along the steep western slopes of the Ghats and therefore not an easy passage for species like elephants, while the eastern corridor is along moderate gradients but traverses more human impacted habitats. There are two bottlenecks on the eastern corridor; one along the banks of the Cauvery where agricultural development disrupts forest contiguity and another is near Nagarahole, where the corridor passes through an agriculture-forest matrix for the last 8-10 kilometres. Movement of tigers from the Nagarahole-Mudumalai-Wayanad landscape to Kudremukh-Bhadra complex is likely to be an important component for tiger population dynamics in this low density landscape. Formal recognition and protection of these least cost pathways as corridors would help ensure long term tiger persistence within this landscape system.

Wayanad Wildlife Sanctuary shares its north-eastern border with Karnataka and is contiguous with parts of Bandipur and Nagarahole in Karnataka and Mudumalai in Tamil Nadu. The Tholpetty Range of Wayanad in Manantoddy taluka is contiguous with Nagarahole while Kurichiat, Sultan's Battery and Muthanga Ranges are contiguous with Bandipur and Mudumalai Tiger Reserve. This landscape (Nagarahole-Wayanad-Mudumalai) hosts the largest contiguous population of tigers and elephants. Wayanad is connected to the Silent Valley National Park in Kerala through Mudumalai and Mukurti in Tamil Nadu.

Nagarahole-Pushpagiri-Talacauvery Corridor

| | |
|--------------------------|---|
| Habitat size | 40589 Km ² |
| Source Population | Bandipur-Nagarahole-Mudumalai-Wayanad |
| Size of Source | 382 (354-411) tigers in 11100 Km ² |
| Protected Areas | Nagarahole WLS Pushpagiri WLS Talacauvery WLS |
| Corridors | Nagarahole WLS-Pushpagiri WLS Pushpagiri WLS-Talacauvery WLS |

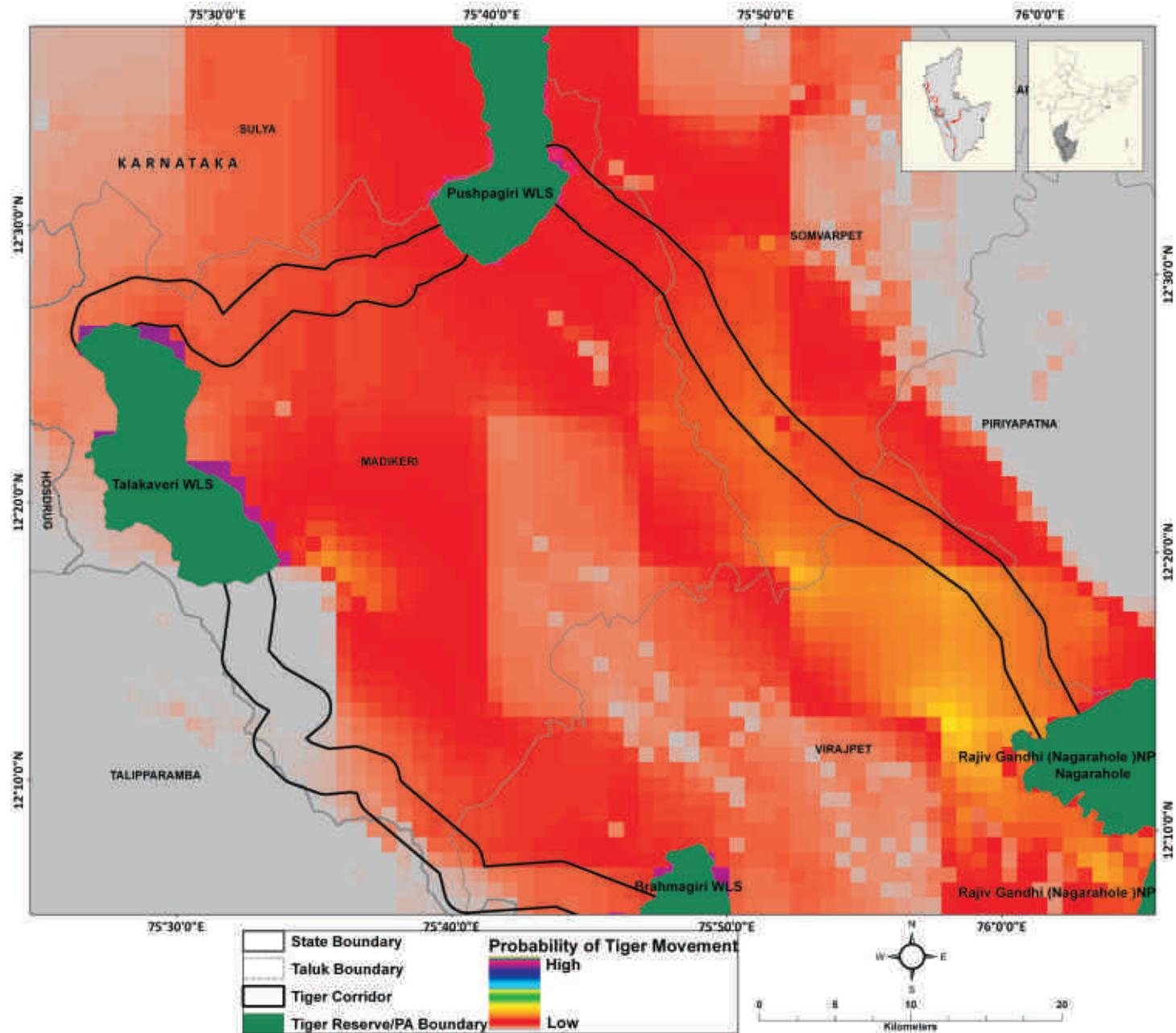
Wayanad-Brahmagiri-Talakaveri WLS

| | |
|--------------------------|--|
| Habitat size | 40589 Km ² |
| Source Population | Bandipur-Nagarahole-Mudumalai-Wayanad |
| Size of Source | 382 (354-411) tigers in 11100 Km ² |
| Protected Areas | Wayanad WLS Brahmagiri WLS Talacauvery WLS |
| Corridors | Wayanad WLS-Brahmagiri WLS Brahmagiri WLS-Talacauvery WLS |



Figure 3.23

Potential habitat connectivity for tiger movement between Nagarahole-Pushpagiri-Talakaveri-Brahmagiri Corridor as depicted by CIRCUITSCAPE model



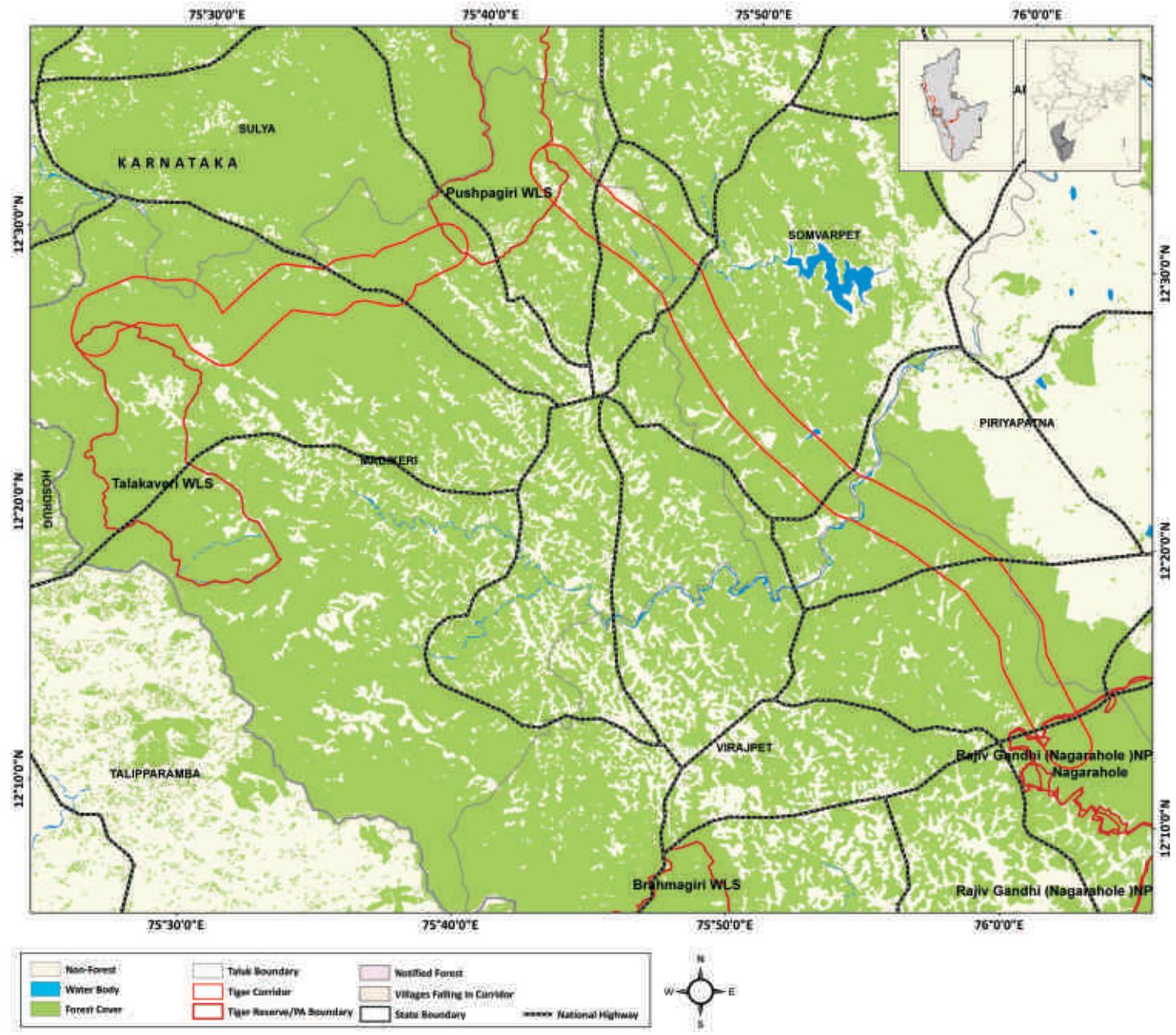


Figure 3.24:
Least Cost Pathway corridor for tiger movement between Nagarahole-Pushpagiri-Talakaveri



Figure 3.25:

Least Cost Pathway corridor for tiger movement between Wayanad-Brahmagiri-Talakaveri WLS



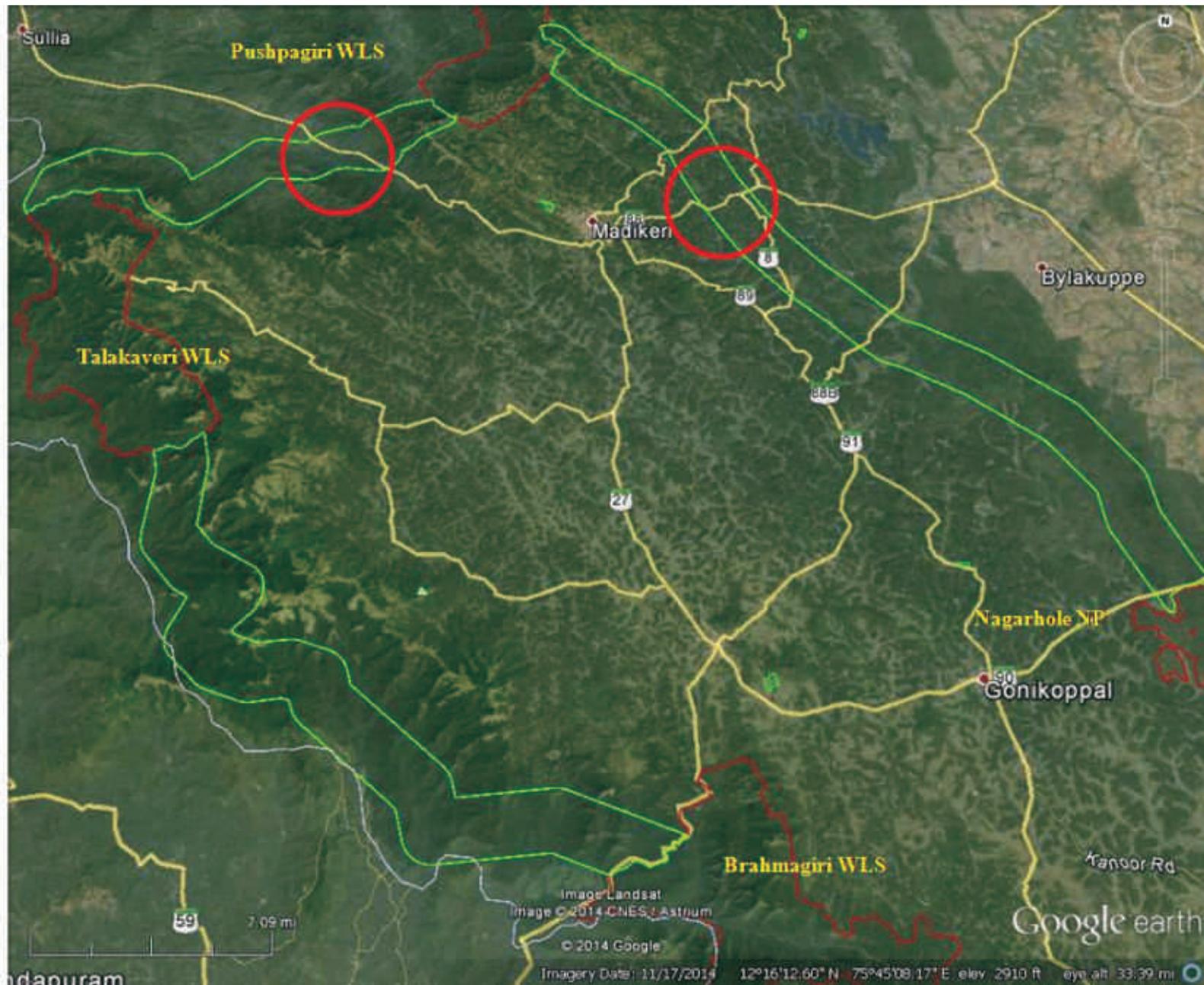


Figure 3.26:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Nagarhole-Pushpagiri-Talakaveri-Brahmagiri



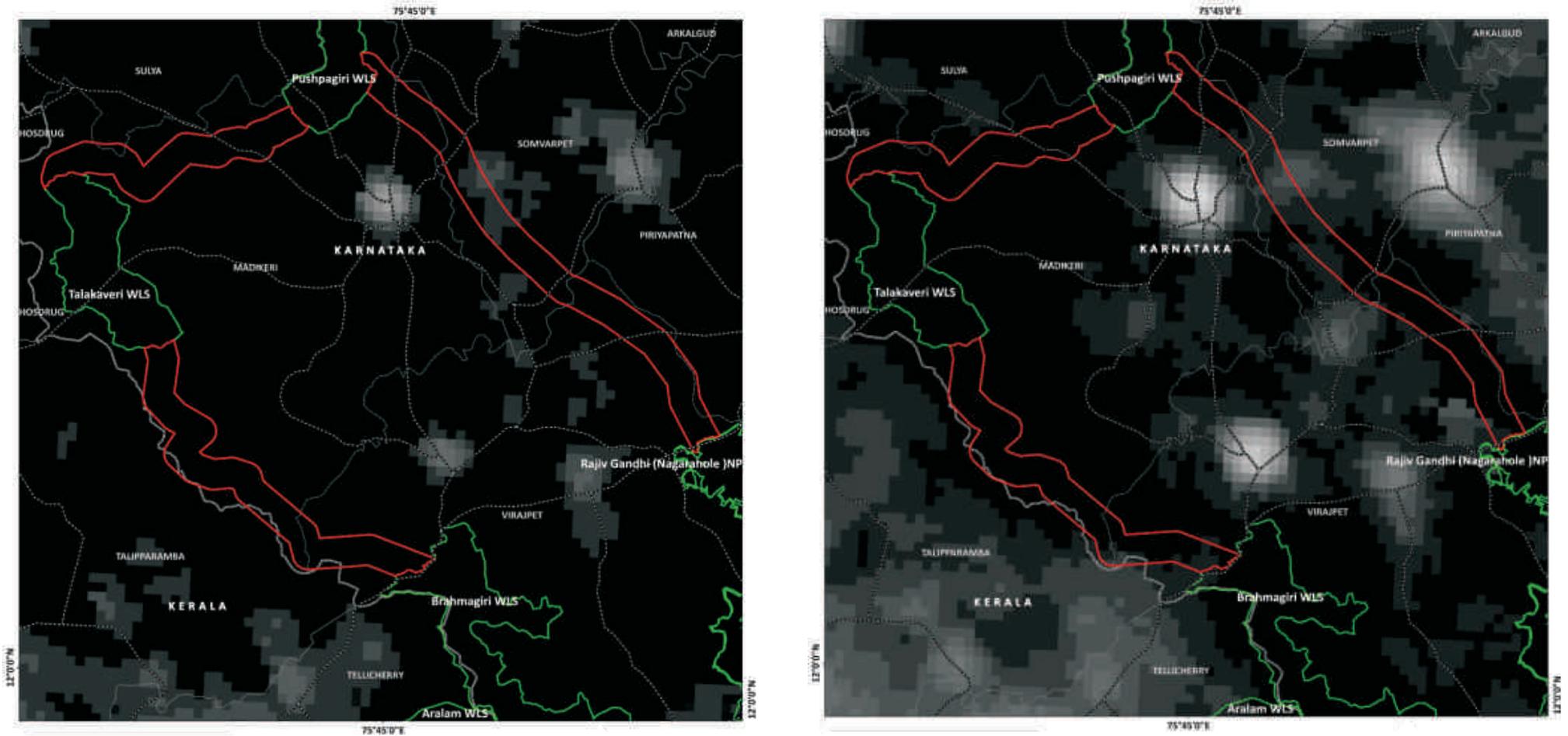
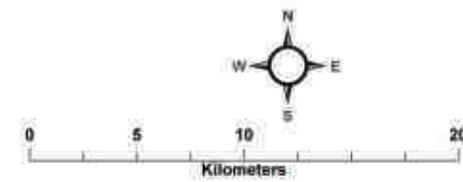


Figure 3.27:

Human habitation as depicted by nightlights within the Nagarahole-Pushpagiri-Talakaveri-Brahmagiri landscape in the year 1992 and 2012



NAGARAHOLE-BANDIPUR-MUDUMALAI-WAYANAD

This landscape has the highest tiger population in India within a network of Protected Areas. This landscape encompasses Wayanad in Kerala, Nagarahole-Bandipur in Karnataka along the northern border with Mudumalai in Tamil Nadu and BRT and Cauvery Wildlife Sanctuary along Karnataka-Tamil Nadu border. This contiguous tiger population stretches across three states, viz., Karnataka (Nagarahole-Bandipur), Tamil Nadu (Mudumalai-Segur plateau-Moyar gorge-Sathyamangalam) and Kerala (Wayanad). In 2010-11, tigers were also camera-trapped in the Segur plateau-Moyar gorge-Sathyamangalam region in Tamil Nadu, providing evidence of resident tiger population as well as possible movement of individuals between this region and BRT Wildlife Sanctuary and onwards to Cauvery Wildlife Sanctuary.

Connectivity between Bandipur, BRT and on to Cauvery Wildlife Sanctuary through the Moyar-Segur-Sathyamangalam forests (Tamil Nadu) shown by the Least Cost Pathways needs to be ensured through inter- state cooperation between Karnataka and Tamil Nadu. Connectivity from BRT to Cauvery Wildlife Sanctuary, though intact, is threatened by growing settlements and agriculture, while connectivity from Cauvery to Bannerghatta Wildlife Sanctuary is through narrow forest strips and "stepping stone" forest patches, in a human-dominated landscape.

Bandipur-Cauveri Corridor

| | |
|--------------------------|---|
| Habitat size | 40589 Km ² |
| Source Population | Bandipur-Nagarahole-Mudumalai-Wayanad |
| Size of Source | 382 (354-411) tigers in 11100 Km ² |
| Protected Areas | Bandipur NP Biligiri Ranganathaswamy WLS Cauvery WLS |
| Corridors | Bandipur NP-Biligiri Ranganathaswamy WLS Corridor Bandipur NP-Cauvery WLS Corridor |

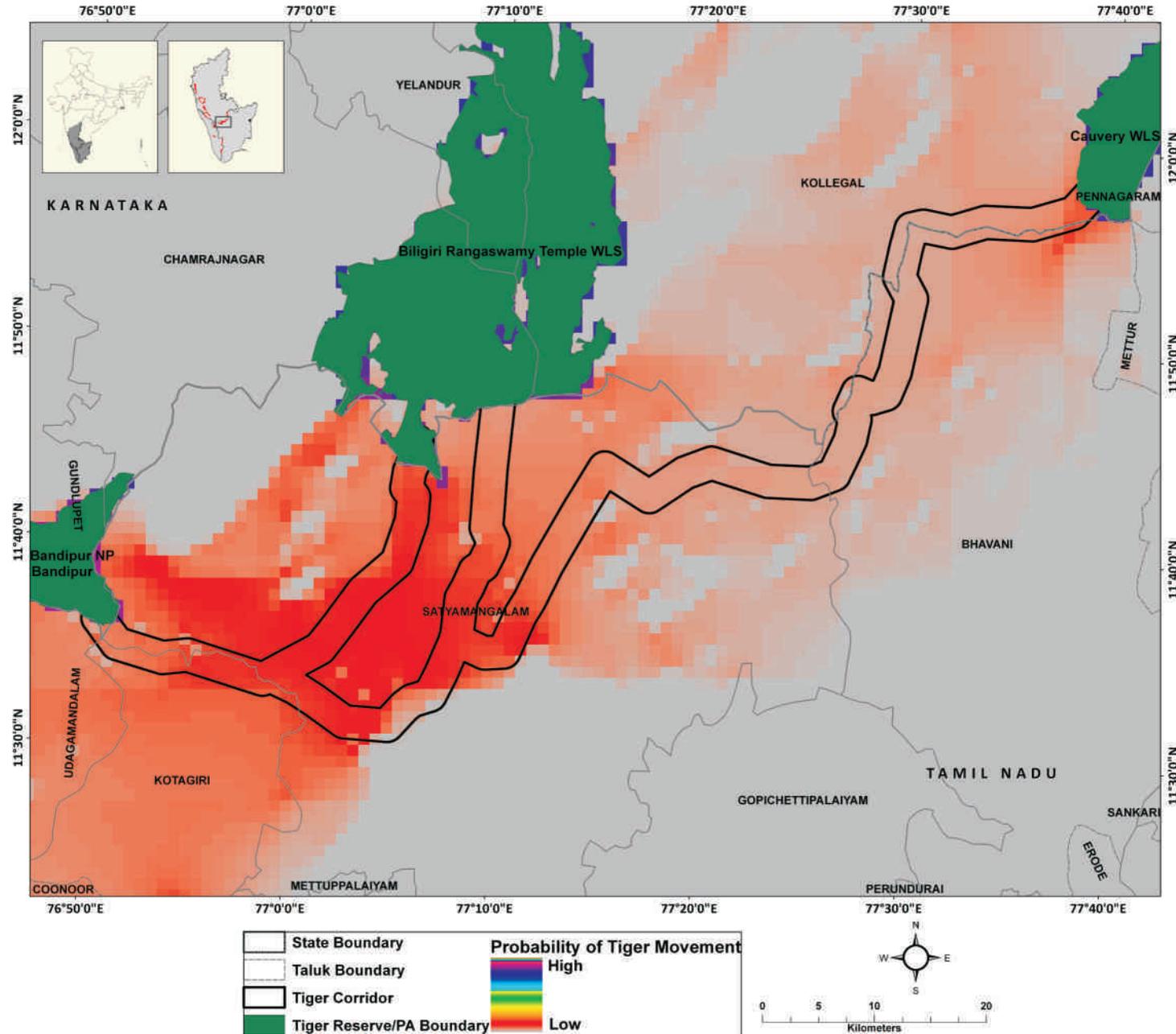
Cauveri-Bannerghata Corridor

| | |
|--------------------------|---|
| Habitat size | 40774 Km ² |
| Source Population | Bandipur-Nagarahole-Mudumalai-Wayanad |
| Size of Source | 382 (354-411) tigers in 11100 Km ² |
| Protected Areas | Cauvery WLS Banerghatta WLS |
| Corridors | Cauvery WLS-Banerghatta WLS Corridor |



Figure 3.28:

Potential habitat connectivity for tiger movement between Bandipur-Cauveri Corridor as depicted by CIRCUITSCAPE model



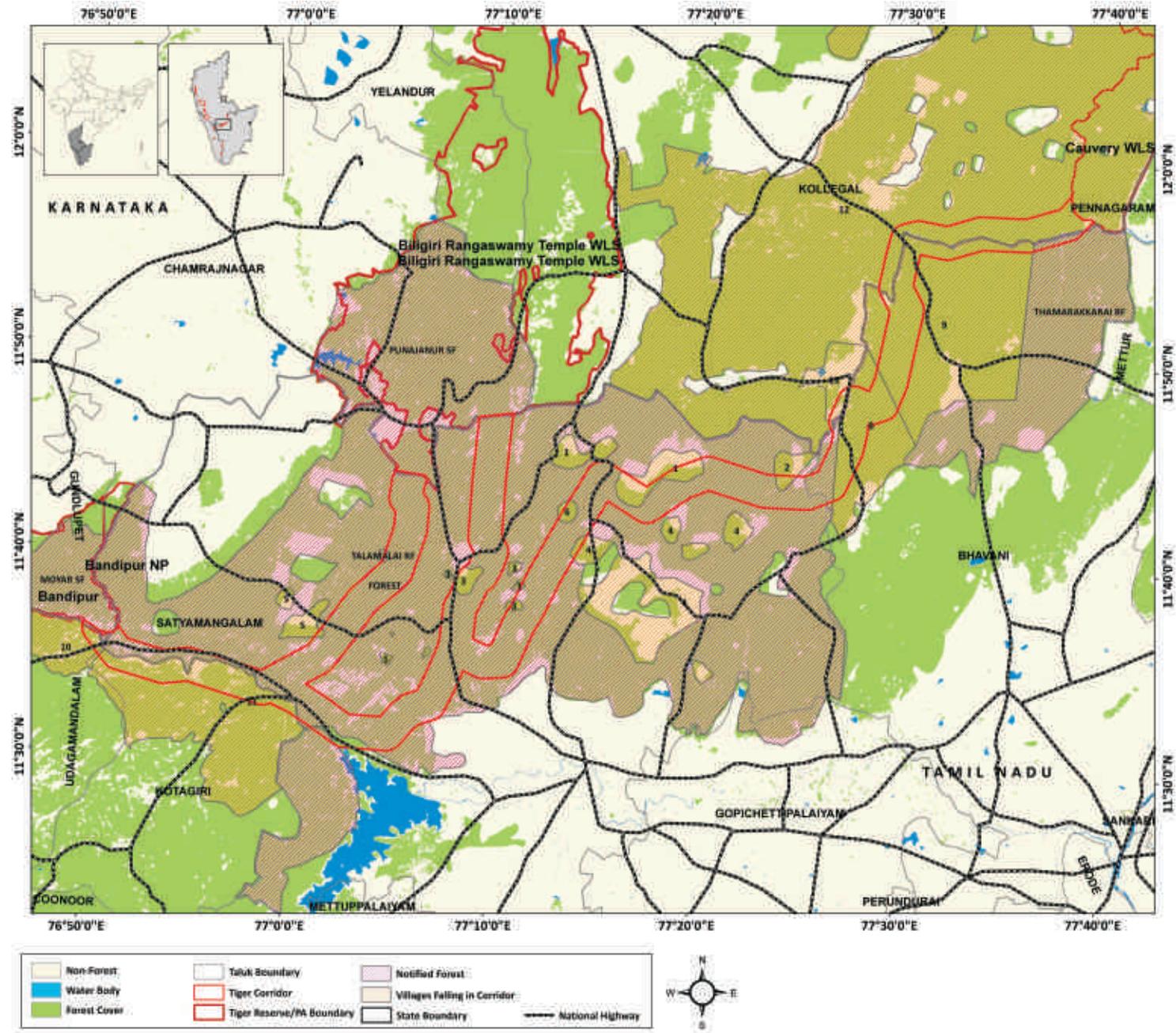


Figure 3.29:
Least Cost Pathway corridor for tiger movement between Bandipur-Cauveri WLS overlaid with village map (the village numbers are referenced in Table 3.6)

Table 3.6:

Villages within the Least Cost Pathway Corridor between Bandipur-Cauveri WLS as shown in Fig. 3.29

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|-----------------|----------------|--------------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | Erode | Sathyamangalam | Thingalur A/b | NA | NA | NA | NA |
| 2 | | | Sathyamangalam | Koothampalayam | 355 | 1457 | 454 | 1918 |
| 3 | | | Sathyamangalam | Hassanur | 953 | 3690 | 1258 | 4454 |
| 4 | | | Sathyamangalam | Guthiyalathur | 3667 | 14213 | 4761 | 17257 |
| 5 | | | Sathyamangalam | Talamalai | 919 | 3659 | 1295 | 4828 |
| 6 | | | Sathyamangalam | Guthiyalathur (addition) | NA | NA | NA | NA |
| 8 | | | Bhavani | Burgur | 3651 | 15874 | 4128 | 17529 |
| 9 | | | Bhavani | Burgur | 3651 | 15874 | 4128 | 17529 |
| 10 | | The Nilgiris | Udhagamandalam | Kadanad | 1788 | 7157 | 3461 | 14692 |
| 11 | | | Kotagiri | Nilgiri Eastern Slopes | 476 | 1369 | NA | NA |
| 12 | Karnataka | Chamaraja Nagar | Kollegal | NA | NA | NA | 82 | 335 |
| 13 | | | Kollegal | Huggiyam | NA | NA | NA | NA |

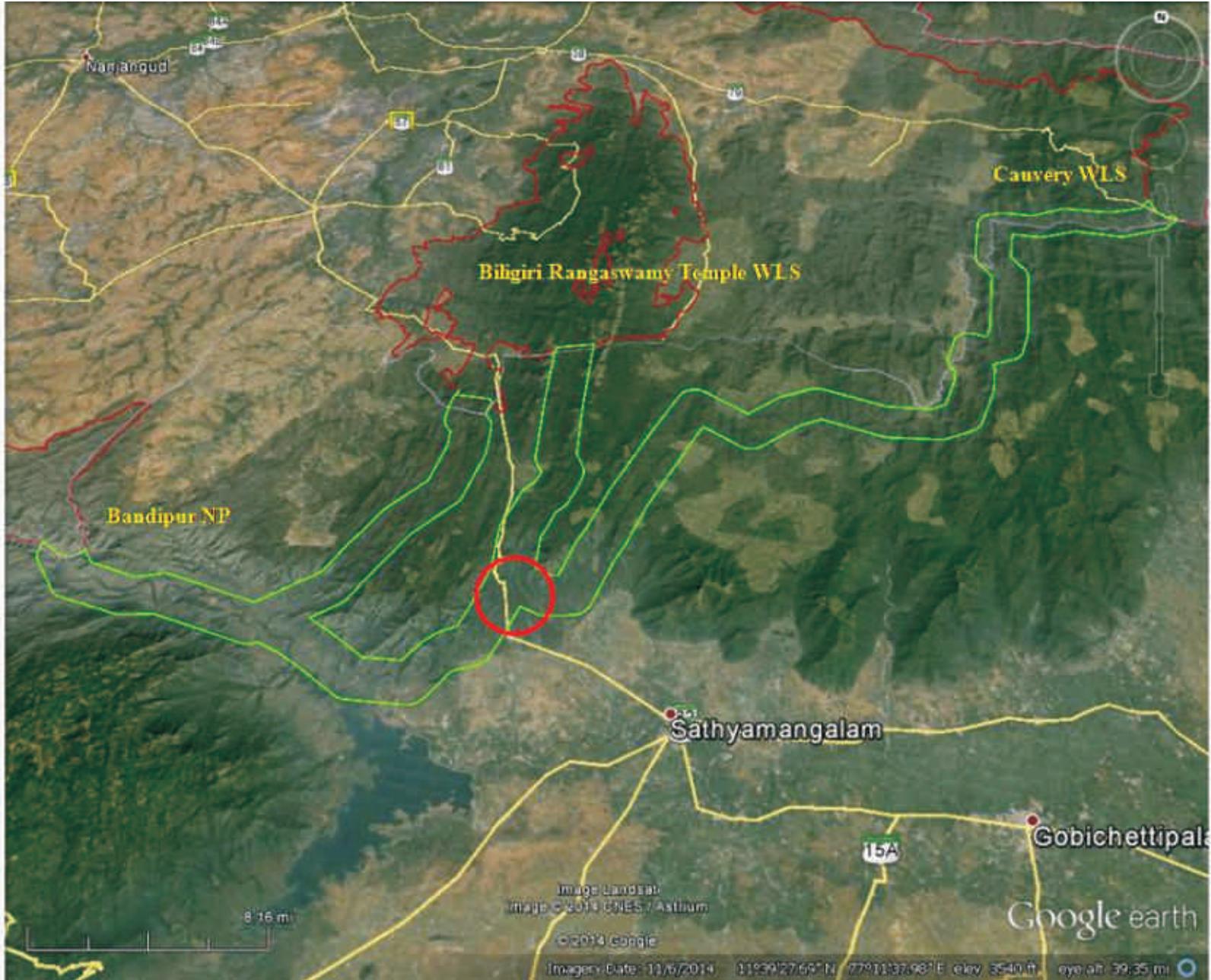


Figure 3.30:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Bandipur-Cauveri



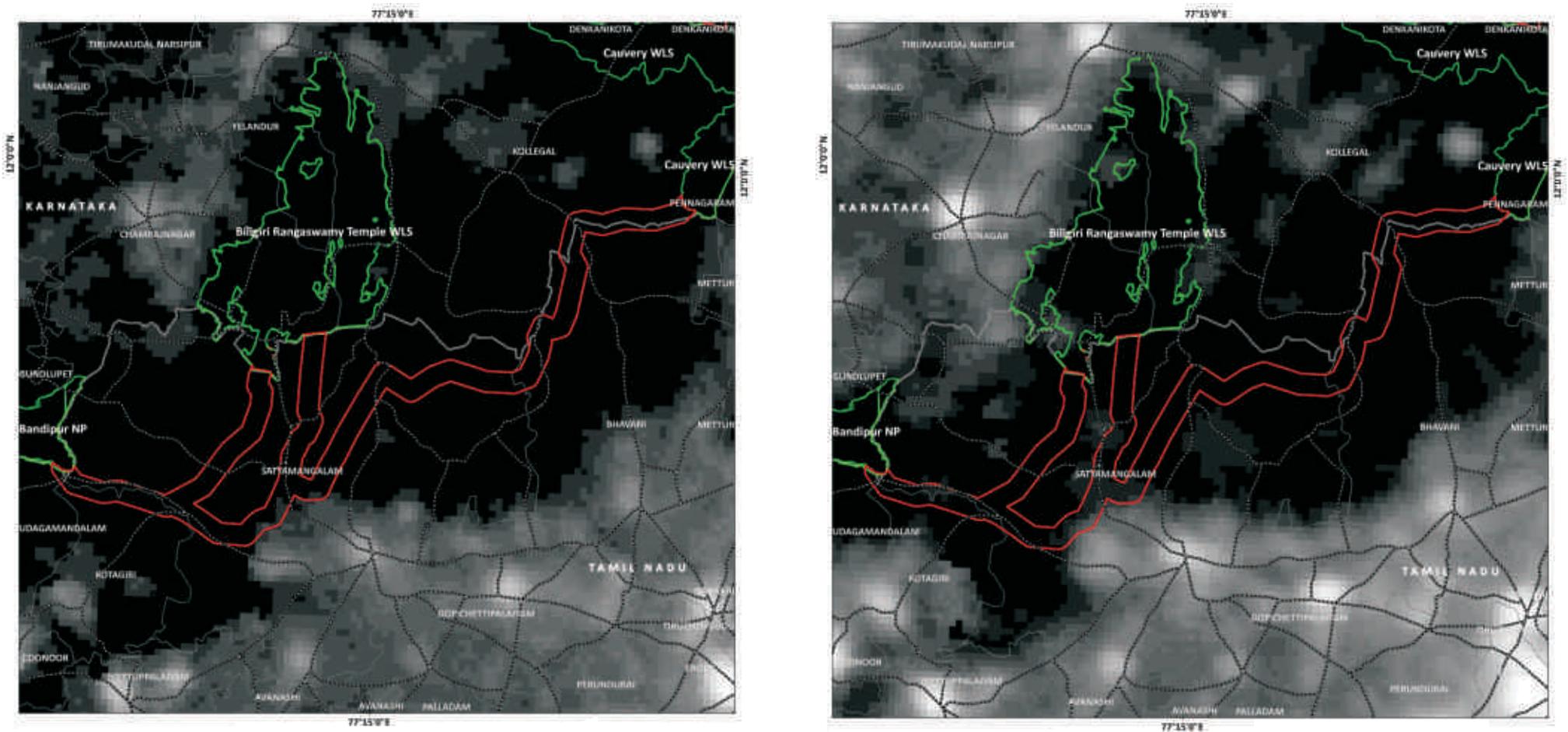
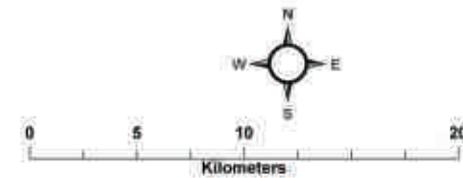


Figure 3.31:

Human habitation as depicted by nightlights within the Bandipur-Cauveri landscape in the year 1992 and 2012



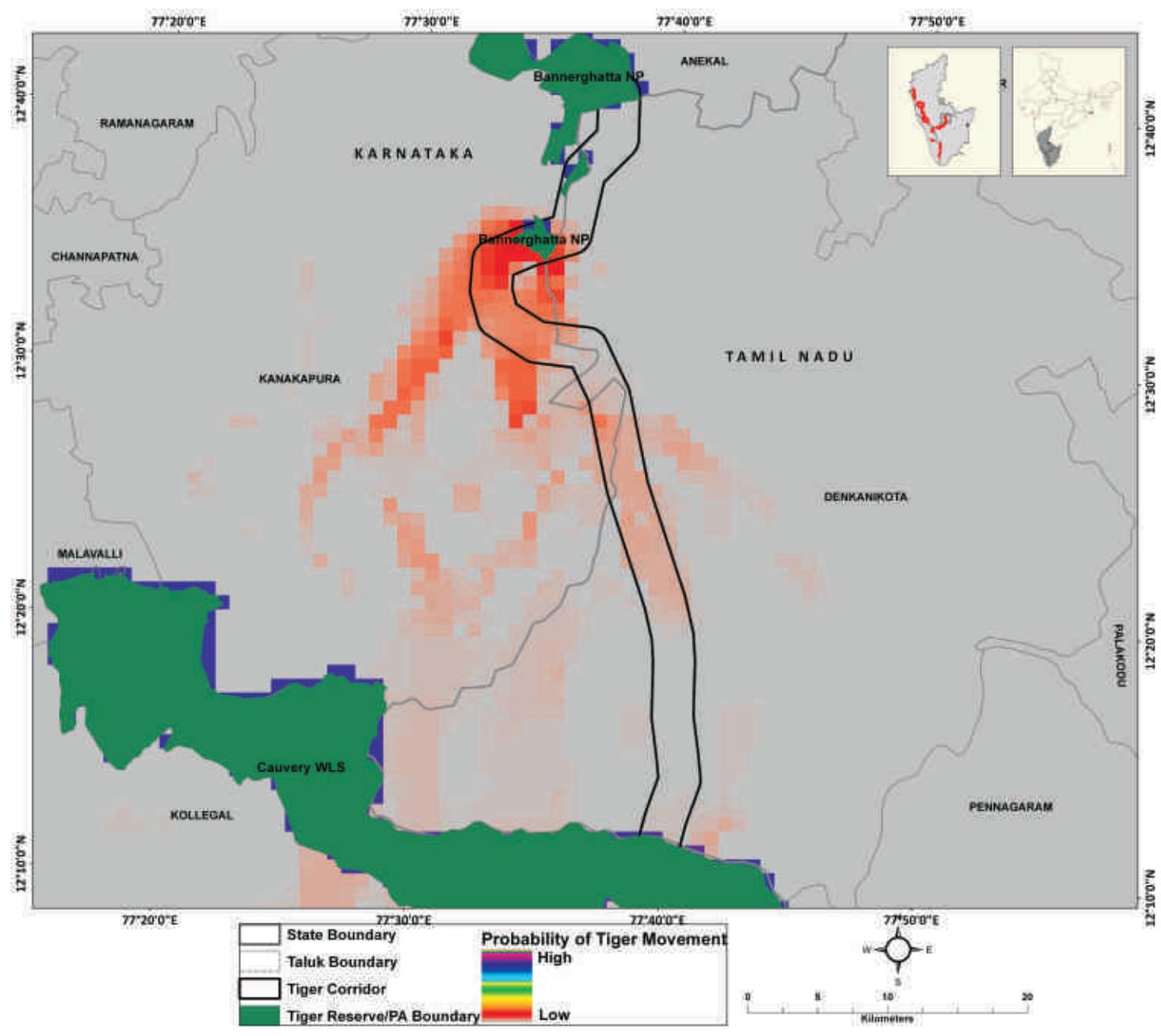
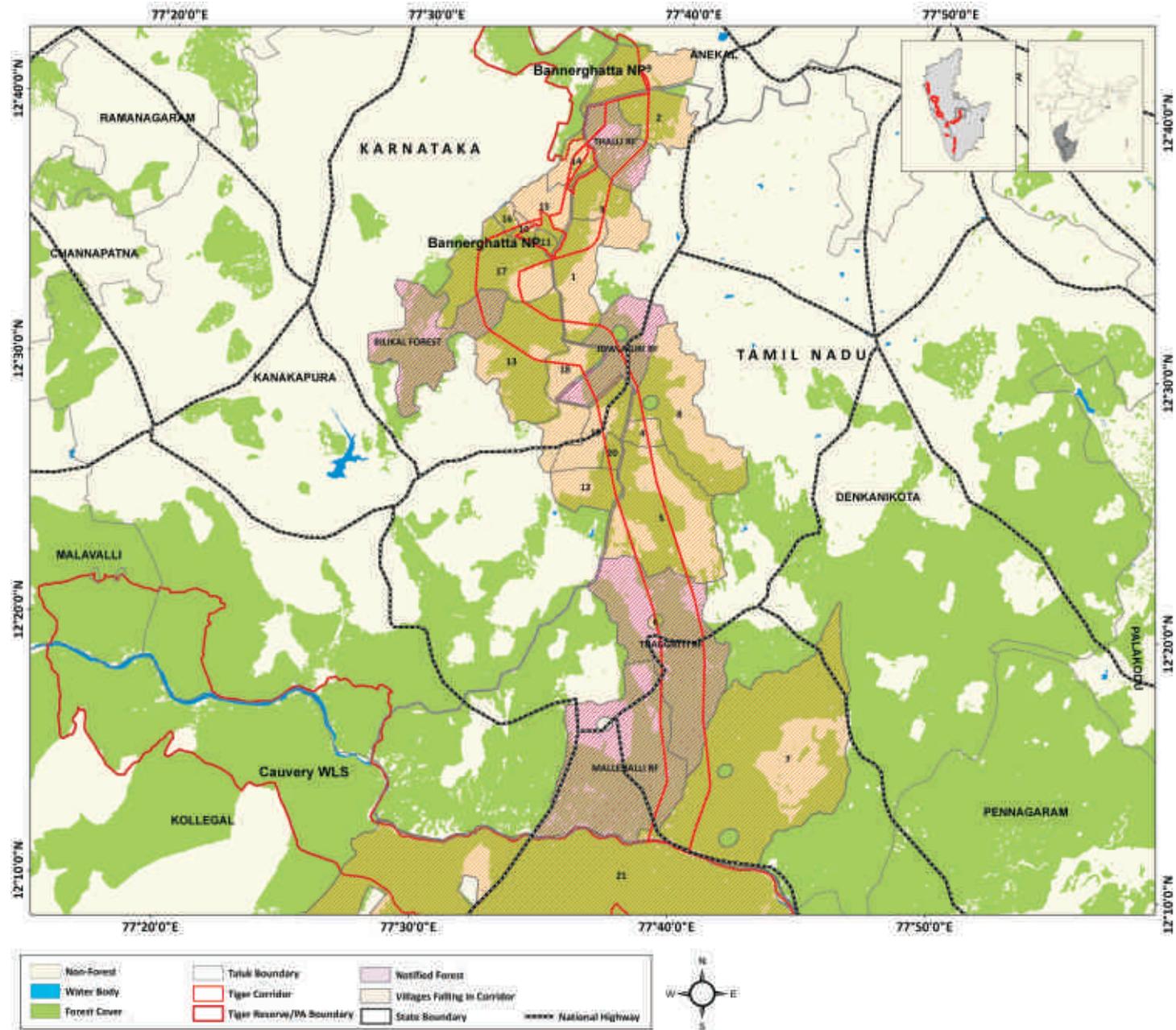


Figure 3.32:
 Potential habitat connectivity for tiger movement between Cauveri-Bannerghata Corridor as depicted by CIRCUITSCAPE model

Figure 3.33:

Least Cost Pathway corridor for tiger movement between Cauveri-Bannerghatta WLS overlaid with village map (the village numbers are referenced in Table 3.7)

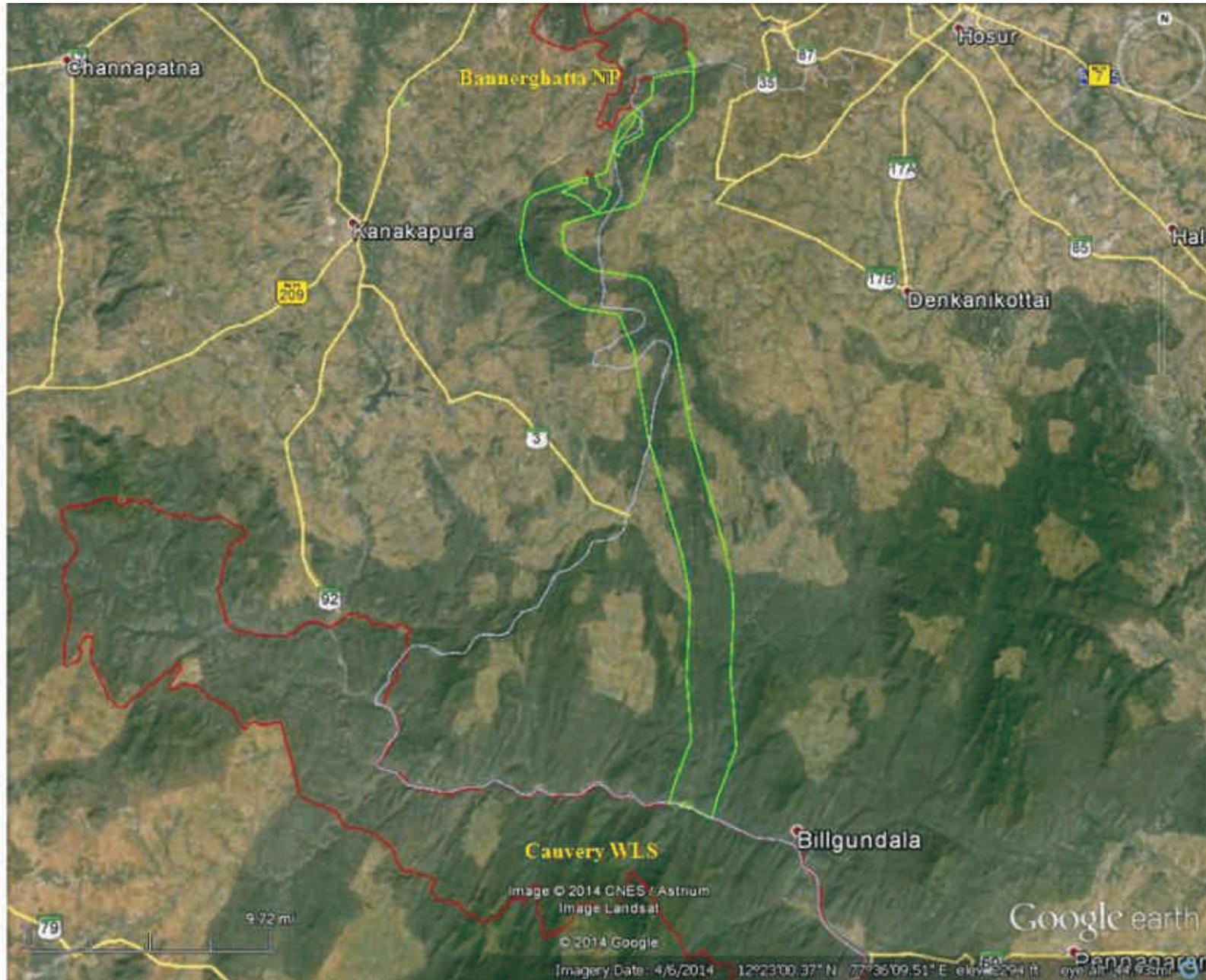


| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|-----------------|---------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | Dharmapuri | Denkanikottai | Achubalu | 567 | 2581 | 762 | 3435 |
| 2 | | | Denkanikottai | Gumlapuram | 521 | 2667 | 723 | 3331 |
| 3 | | | Denkanikottai | Chudasandiram | 306 | 1628 | 393 | 1727 |
| 4 | | | Denkanikottai | Nendimangalam | 68 | 363 | 105 | 578 |
| 5 | | | Denkanikottai | Madakkal | 986 | 5228 | 1175 | 5383 |
| 6 | | | Denkanikottai | Thaggatti | 944 | 4429 | 1116 | 5153 |
| 7 | | | Denkanikottai | Natrapalayam | 1564 | 7029 | 2258 | 9687 |
| 8 | | | Denkanikottai | Agalakotta A/b | NA | NA | NA | NA |
| 9 | Karnataka | Bangalore Urban | Anekal | Tammanayakanahalli | 432 | 2271 | 549 | 2527 |
| 10 | | Bangalore Rural | Kanakapura | Linganapura | 137 | 662 | 205 | 793 |
| 11 | | | Kanakapura | Bantanalu | 4 | 17 | 23 | 85 |
| 12 | | | Kanakapura | Bijjahalli | 276 | 1124 | 294 | 1130 |
| 13 | | | Kanakapura | Kengalanatta Gollahalli | 102 | 449 | 112 | 471 |
| 14 | | | Kanakapura | Kattarinatta | 36 | 182 | 43 | 138 |
| 15 | | | Kanakapura | Elachavadi | NA | NA | NA | Na |
| 16 | | | Kanakapura | Bhimasandra | 59 | 257 | 104 | 441 |
| 17 | | | Kanakapura | Terubidi | 335 | 1518 | 374 | 1601 |
| 18 | | | Kanakapura | Gatgunda | 719 | 3631 | 692 | 2816 |
| 19 | | | Kanakapura | Kolagaudahalli | 706 | 3502 | 712 | 3257 |
| 20 | | | Kanakapura | Manjilnatha | NA | NA | NA | NA |
| 21 | | Chamaraja Nagar | Kollegal | NA | NA | NA | 82 | 335 |

Table 3.7:
Villages within the Least Cost Pathway Corridor between Cauveri-Bannerghata WLS as shown in Fig. 3.33

Figure 3.34:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Cauveri-Bannerghata



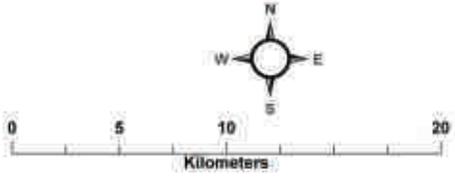
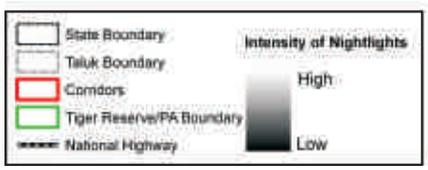
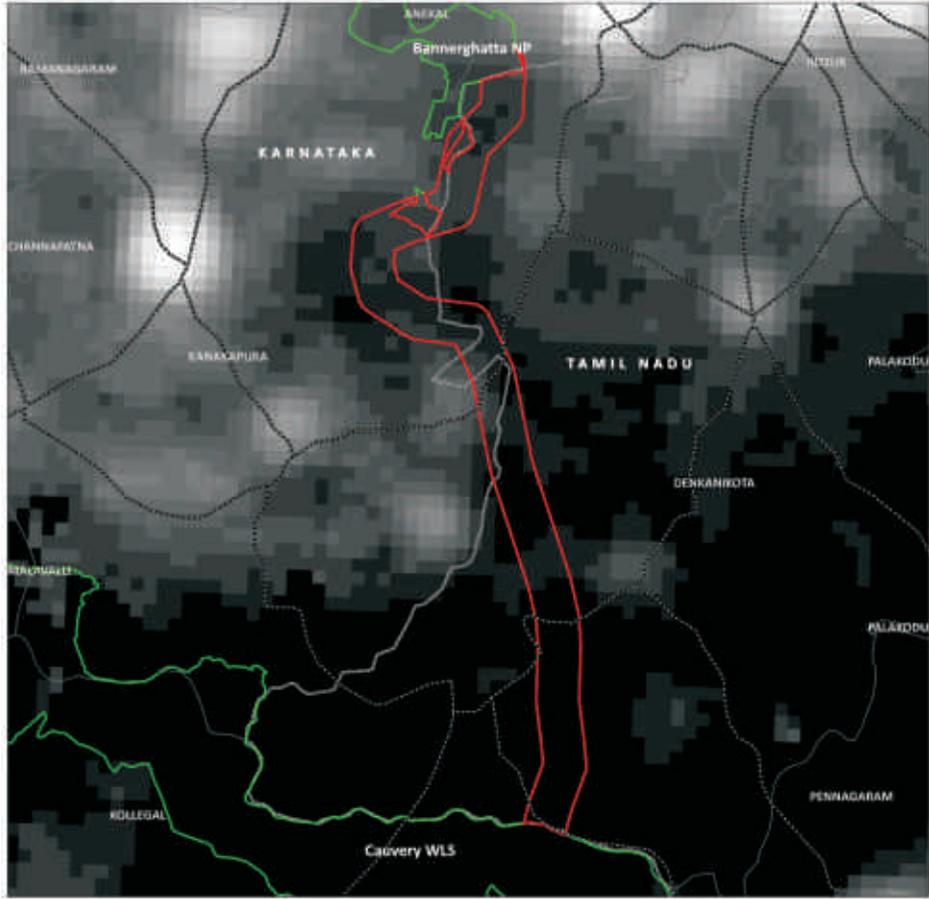
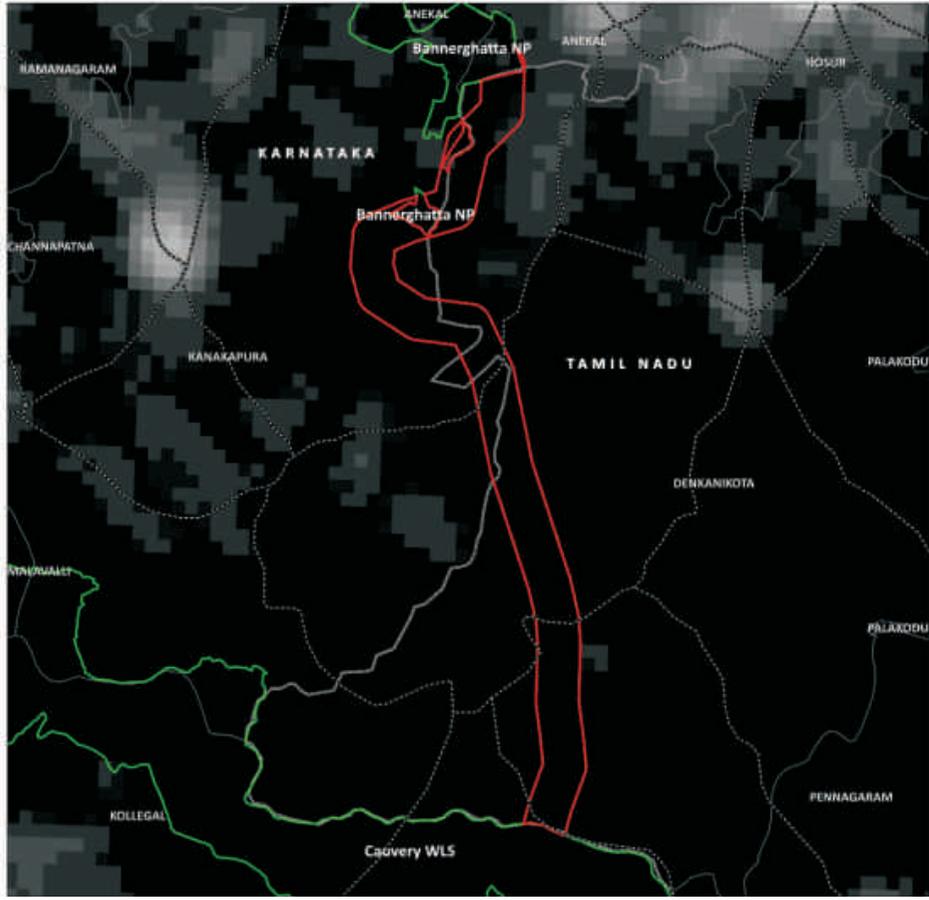


Figure 3.35:
 Human habitation as depicted by nightlights within the Cauveri-Bannerghata landscape in the year 1992 and 2012

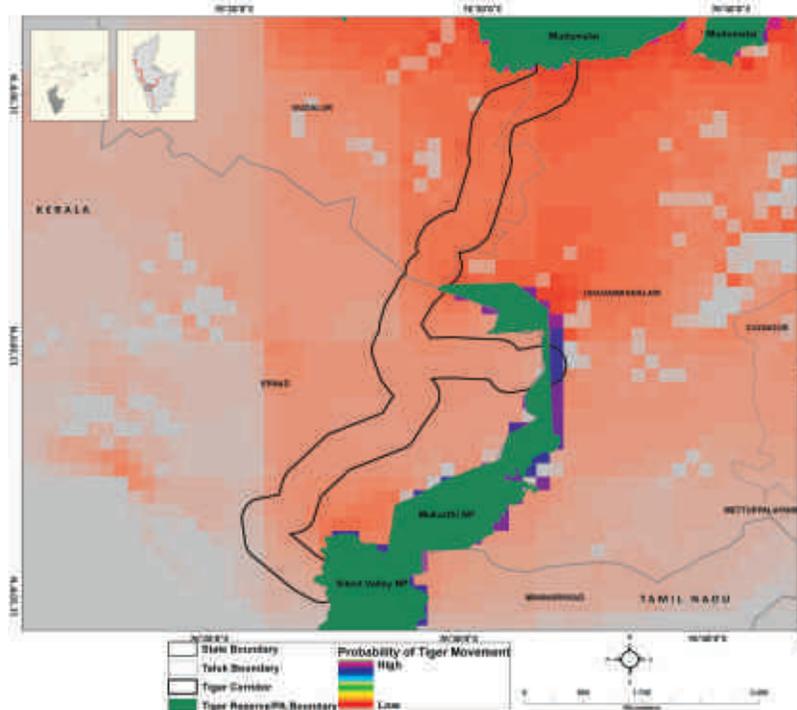
NAGARAHOLE-MUDUMALAI-WAYANAD

The Mudumalai landscape is connected through the forested slopes of the Nilgiris to the Mukurthi National Park in the south which is further connected to Silent Valley. Due to the rugged and steep nature of this connectivity, elephants are unlikely to use it, but it would serve as a viable corridor for tigers and other fauna. Towards the east, Sathyamangalam Wildlife Sanctuary connects with the corridor formed by the Moyar River valley connecting the Bandipur-Mudumalai complex with BRT Wildlife Sanctuary and on to Cauvery Wildlife Sanctuary.

Within the southern buffer of Mudumalai and its surroundings, the habitat is fragmented by large and small settlements like Masinagudi and Moyar colony. Many of these private lands are being developed into tourist resorts with elephant proof power fencing. Linear infrastructure like the power channel from Masinagudi to Moyar and the water pipeline from Glenmorgan to Singara further prevent free movement of species like elephants across these forests. Restrictions on unfriendly developments and mitigation of existing linear infrastructure are needed for full utilization of this landscape by wildlife. Addressing the above issues and legitimizing the two corridors defined by the Least Cost Pathways would enhance the conservation potential of this important reserve complex further.

Figure 3.36:

Potential habitat connectivity for tiger movement between Mudumalai-Mukurthi-Silent Valley Corridor as depicted by CIRCUITSCAPE model



Mudumalai-Mukurthi-Silent Valley Corridor

| | |
|--------------------------|---|
| Habitat size | 40589 Km ² |
| Source Population | Bandipur-Nagarahole-Mudumalai-Wayanad |
| Size of Source | 382 (354-411) tigers in 11100 Km ² |
| Protected Areas | Mudumalai NP Mukurthi NP Silent Valley NP |
| Corridors | Mudumalai NP-Mukurthi NP Mudumalai NP-Silent Valley NP Mukurthi NP-Silent Valley NP |

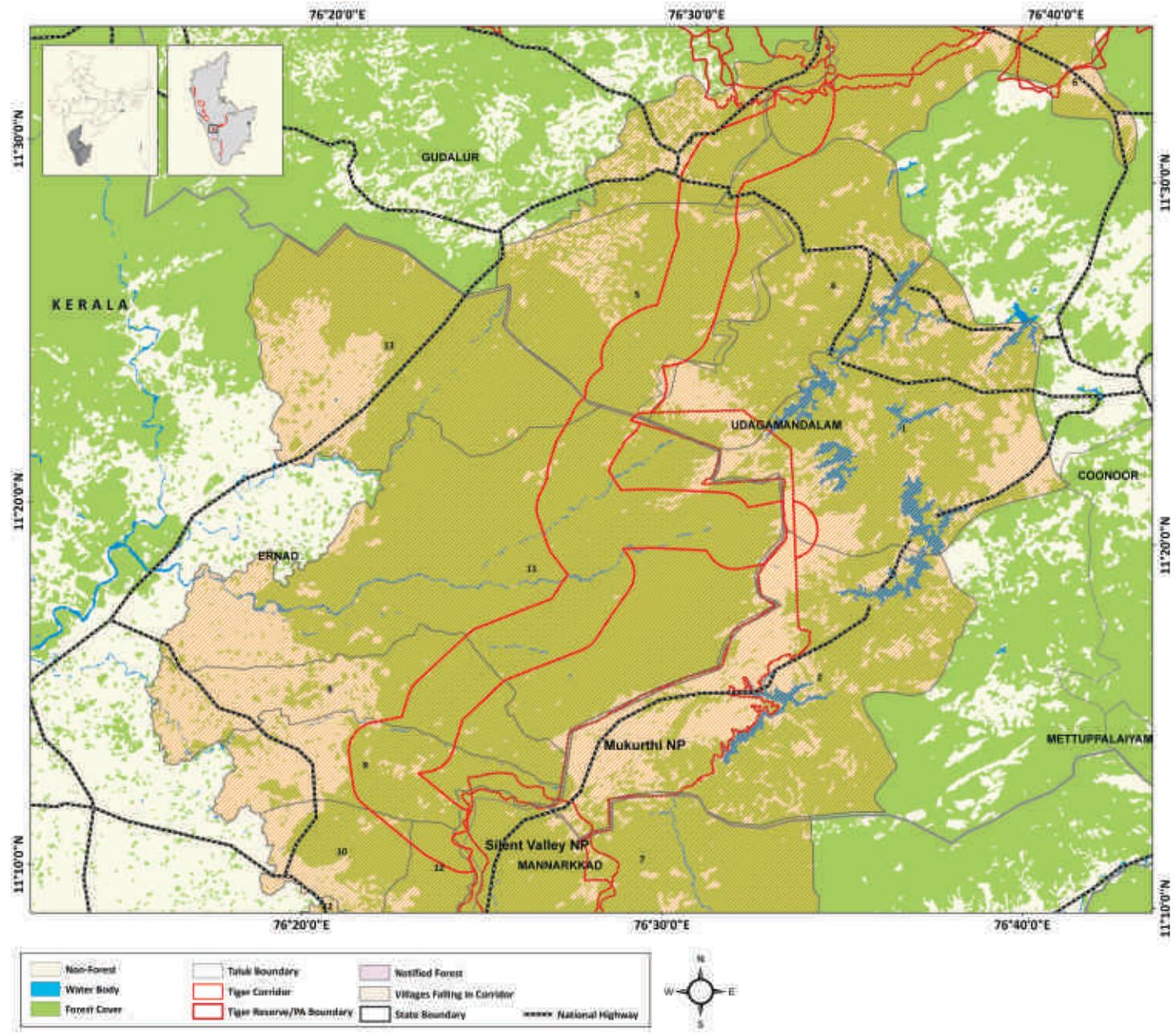


Figure 3.37:
Least Cost Pathway corridor for tiger movement between Mudumalai-Mukurthi-Silent Valley overlaid with village map (the village numbers are referenced in Table 3.8)

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|--------------|----------------|----------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | The Nilgiris | Udhagamandalam | Nanjanad | 3553 | 14310 | 3621 | 13007 |
| 2 | | | Kundah | Mulligoor | 1491 | 5393 | 1363 | 4647 |
| 3 | | | Gudalur | Gudalur (tn-1) | 9508 | 43096 | 12101 | 49535 |
| 4 | | | Udhagamandalam | Naduvattam | 2572 | 11370 | 2340 | 8505 |
| 5 | | | Gudalur | Ovalley | 5465 | 24793 | 5307 | 21943 |
| 6 | | | Udhagamandalam | Masinigudi | NA | NA | NA | NA |
| 7 | Kerala | Palghat | Mannarkkad | Padavayal | 1686 | 6764 | 1719 | 6144 |
| 8 | | Malappuram | Ernad | Amarambalam | 6284 | 31928 | 7841 | 35975 |
| 9 | | | Ernad | Chekkode | 3042 | 16850 | 3841 | 19510 |
| 10 | | | Ernad | Kalikavu | 4504 | 25861 | 4435 | 22018 |
| 11 | | | Ernad | Karulai | 4685 | 24336 | 5537 | 25758 |
| 12 | | | Ernad | Kerala Estate | 1818 | 10299 | 2893 | 14871 |
| 13 | | | Ernad | Vazhikkadavu | 8308 | 44083 | 9972 | 47322 |

Table 3.8:

Villages within the Least Cost Pathway Corridor between Mudumalai-Mukurthi-Silent Valley WLS as shown in Fig. 3.37

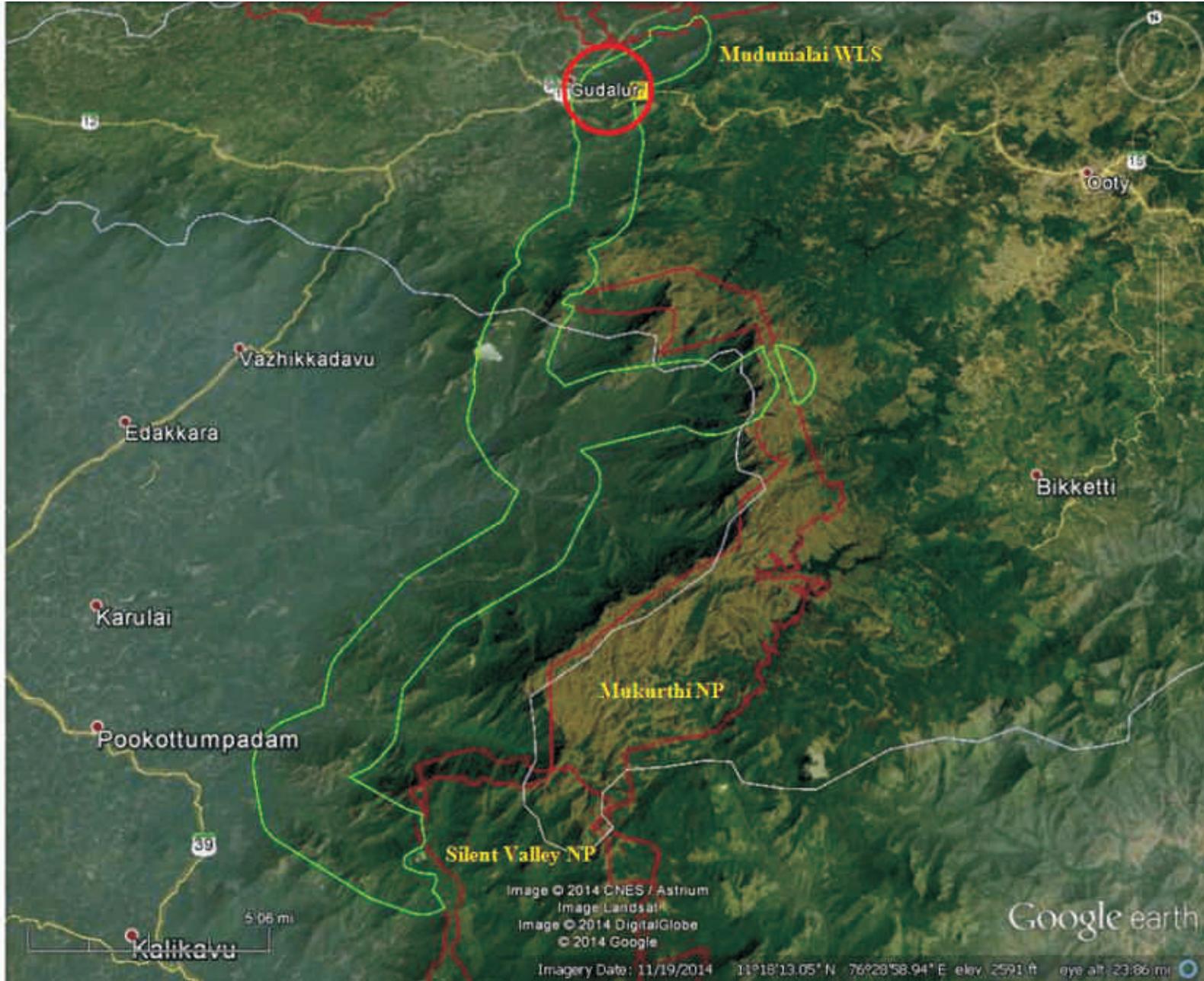


Figure 3.38:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mudumalai-Mukurthi-Silent Valley WLS



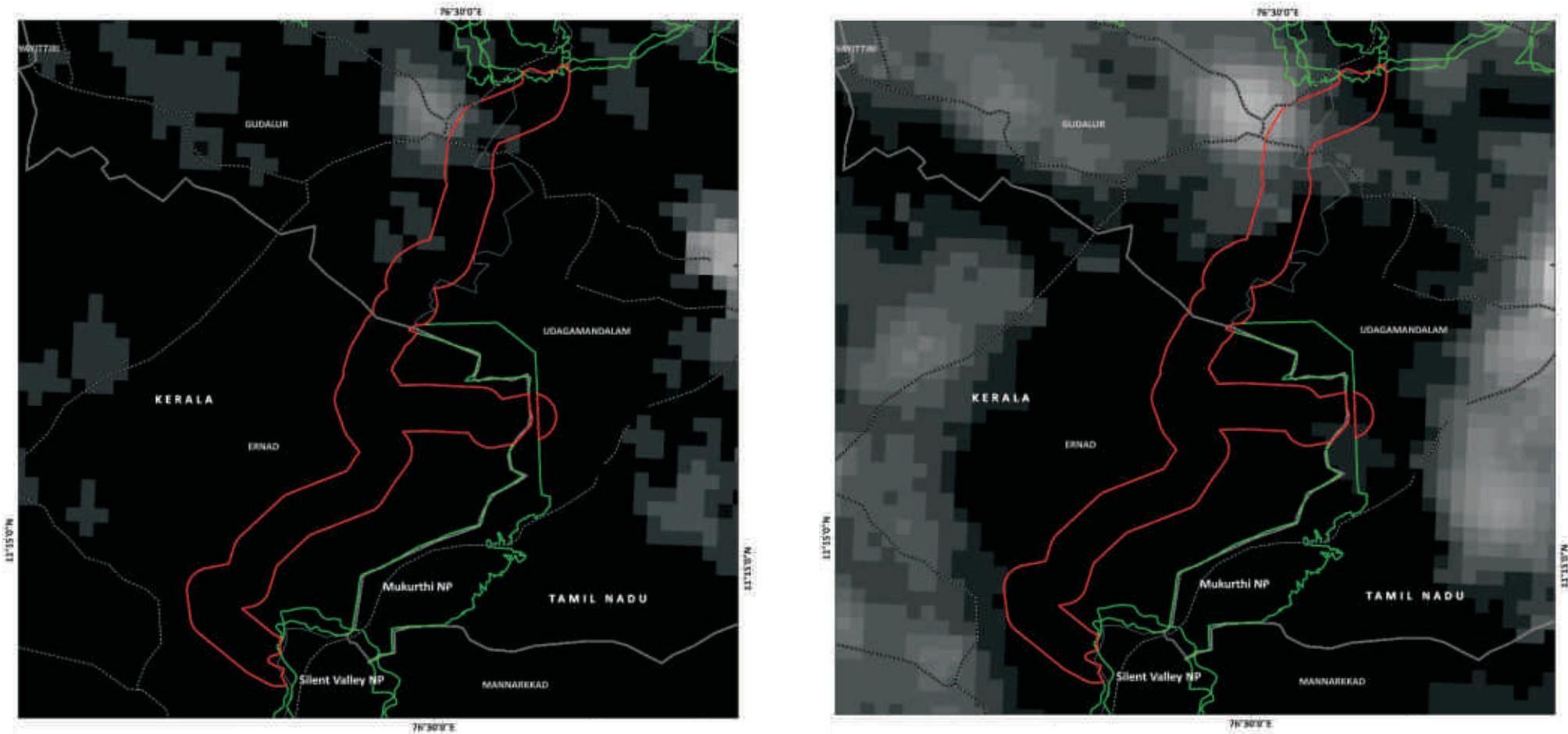
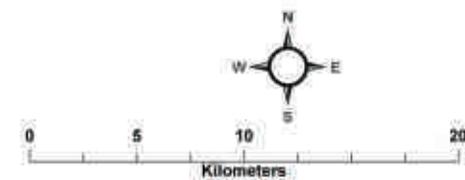
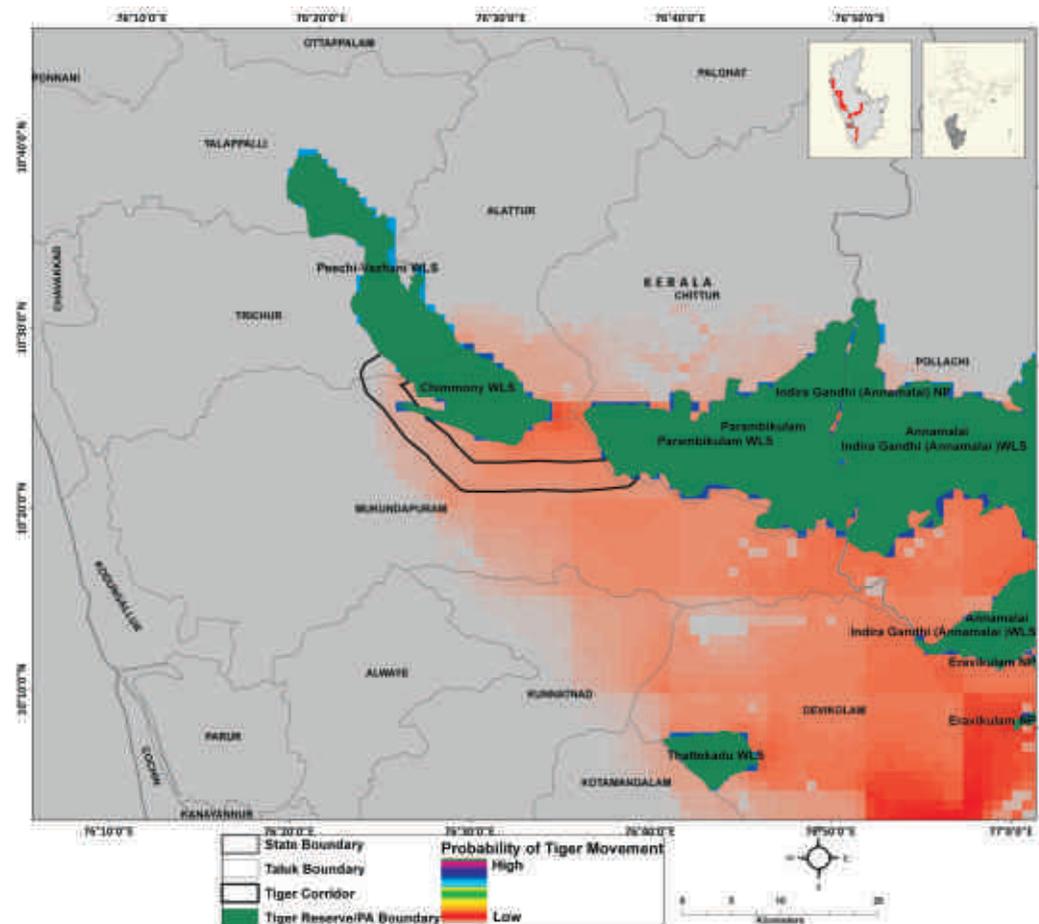


Figure 3.39:

Human habitation as depicted by nightlights within the Mudumalai-Mukurthi-Silent Valley WLS landscape in the year 1992 and 2012



PARAMBIKULAM-ERAVIKULAM-INDIRA GANDHI

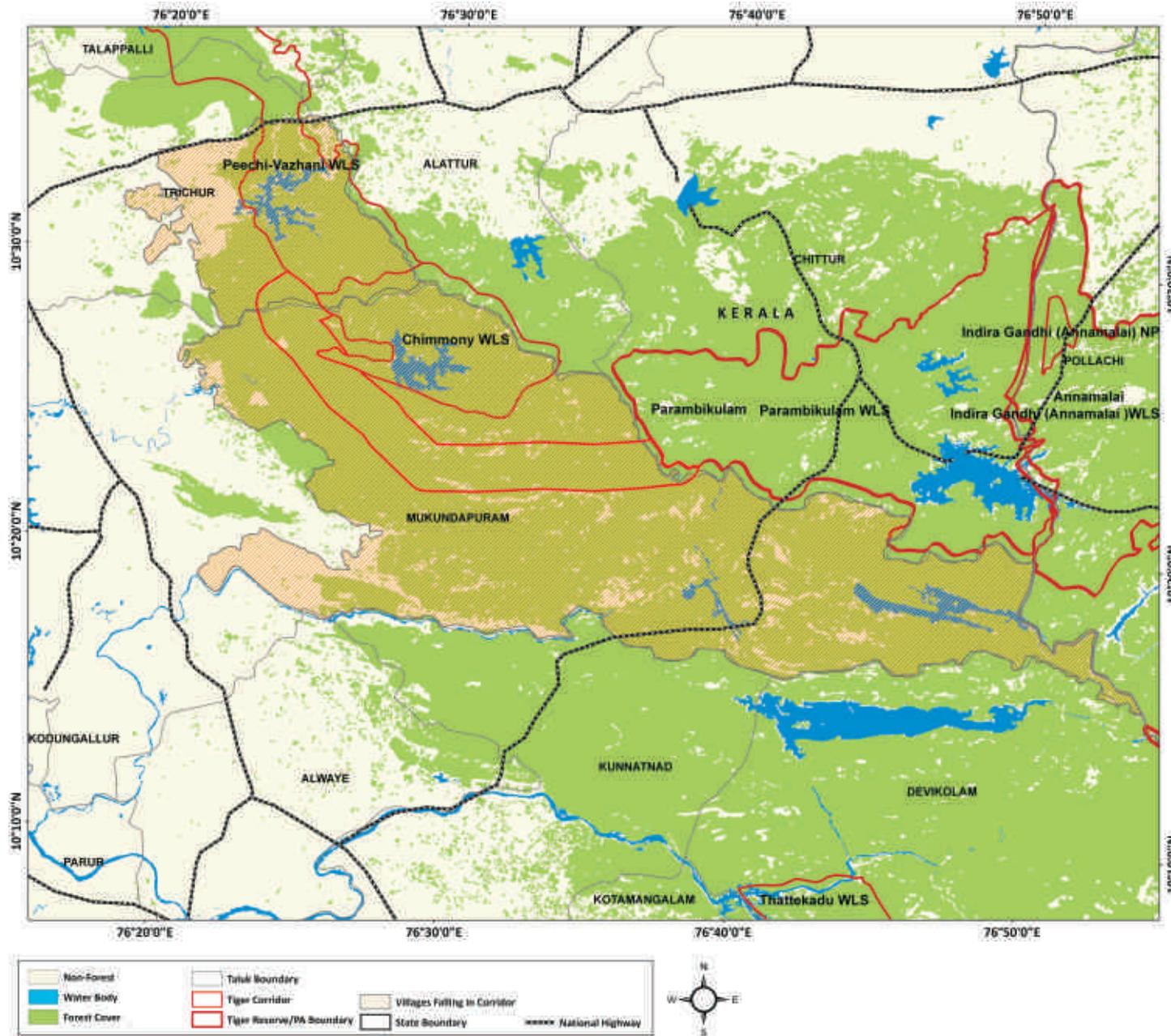


This is the first major tiger population south of the Palghat Gap, which is a major barrier to geneflow from the northern Western Ghats to the southern Western Ghats for most wildlife species including tigers, due to its high human density. This tiger population is spread over Parambikulam Tiger Reserve, Eravikulam National Park and Chinnar Wildlife Sanctuary in Kerala; and Indira Gandhi (Annamalai) Tiger Reserve in Tamil Nadu. The landscape has shown good recovery due to good management of the several reserves constituting the complex, lower human pressures due to the difficult terrain and contiguous nature of the tiger habitat. Within Kerala, this zone comprises of several Protected Areas which include Peechi-Vazhani Wildlife Sanctuary, Chimmony Wildlife Sanctuary, Eravikulam National Park, Chinnar Wildlife Sanctuary and Parambikulam Tiger Reserve. The tiger habitat in this zone is contiguous with the Indira Gandhi (Annamalai) Tiger Reserves in Tamil Nadu and with, Anaimudi and Pambadum Shola National Park which are located within Devikulam taluka of Idukki district in Kerala. All of these Protected Areas are connected through forested habitats interspersed with plantations, agriculture, and settlements, consisting of a habitat matrix that is permeable for movement of wildlife. However, two formal corridor systems are required: one connecting Peechi-Chimmony to Parambikulam and second, connecting Anaimudi Shola National Parks to Pambadum Shola which further extends into Mathikettan Shola National Park. This connectivity extends further south

Figure 3.40: Potential habitat connectivity for tiger movement between Chimmony-Parambikulam Corridor as depicted by CIRCUITSCAPE model

Figure 3.41:

Least Cost Pathway corridor for tiger movement between Chimmony-Parambikulam WLS overlaid with village map (the village numbers are referenced in Table 3.9)



along the border of Kerala and Tamil Nadu as narrow ridge top forests of the Ghats, through plantations and agriculture west of the Ghat ridge, connecting the population of this landscape with that of Periyar-Kalakad-Mundanthurai. This connectivity is very precarious and needs ground verification as the least cost pathways traverse lot of privately owned lands and distinguishing between plantations and forests through remotely sensed data was difficult. Ground verification is required urgently and conservation action is needed to secure this connectivity. Tiger occupancy on the Kerala side of this landscape was 1,483 km² with an estimated population of 32 to 36 tigers. This area showed a significant increase in both, the area occupied by tigers since 2006 and their abundance.

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|--------|----------|--------------|-----------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | KERALA | THRISSUR | Mukundapuram | Pariyaram | 7560 | 31615 | 8122 | 31195 |
| 2 | | | Thrissur | Peechi | 5083 | 22409 | 6706 | 26946 |



Table 3.9.
Villages within the Least Cost Pathway Corridor between Chimmony-Parambikulam WLS as shown in Fig. 3.41

Figure 3.42:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Chimmony-Parambikulam WLS

Chimmony-Parambikulam Corridor

| | |
|--------------------------|--|
| Habitat size | 13233 Km ² |
| Source Population | Parambikulam-Indira Gandhi |
| Size of Source | 3a4 (32-36) tigers in 3253 Km ² |
| Protected Areas | Chimmony WLS Parambikulam WLS |
| Corridors | Parambikulam WLS-Chimmony WLS Corridor |

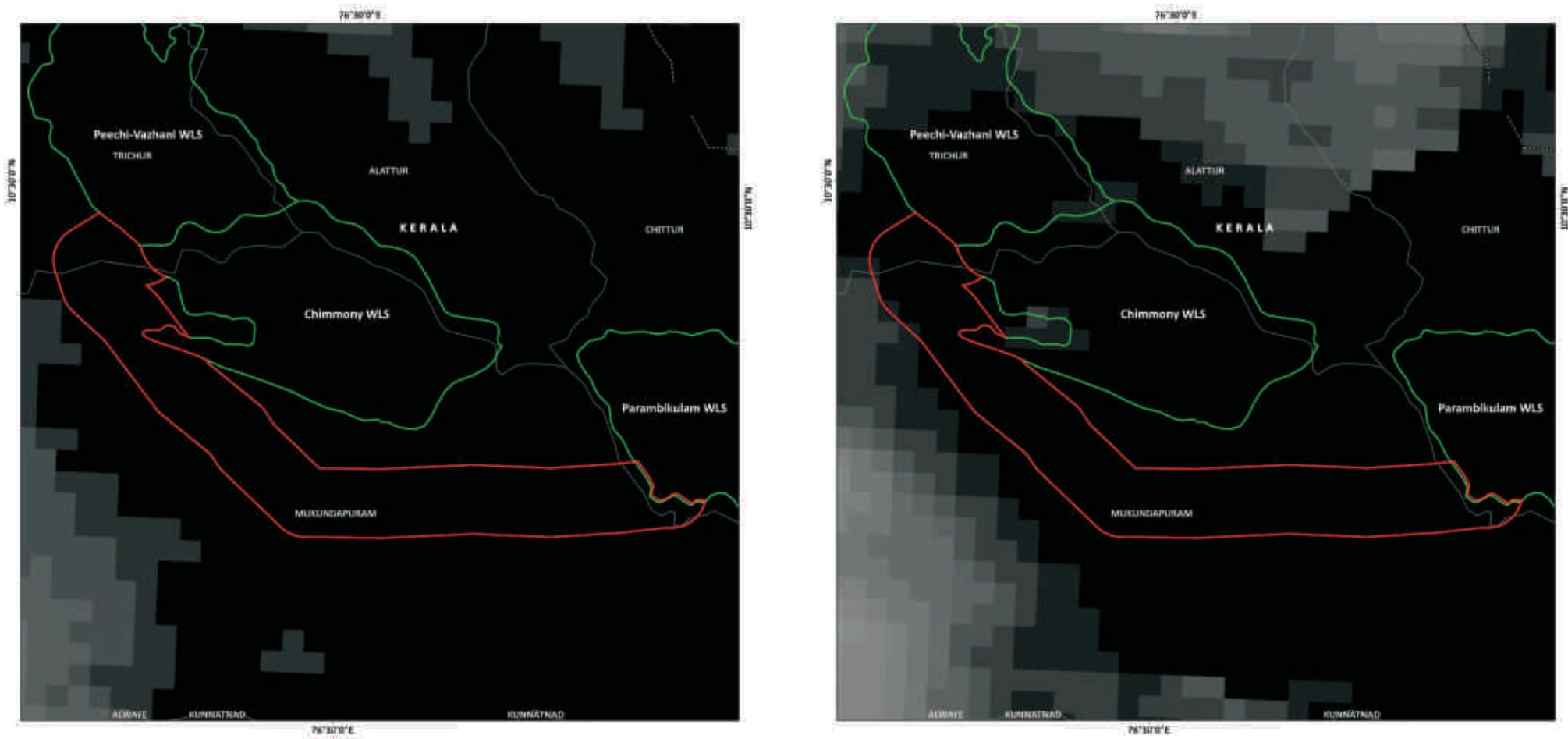
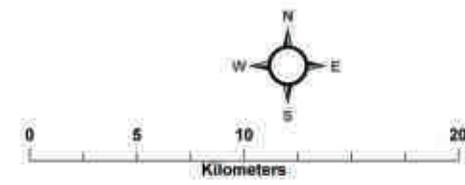


Figure 3.43:
Human habitation as depicted by nightlights within the Chimmony-Parambikulam WLS landscape in the year 1992 and 2012



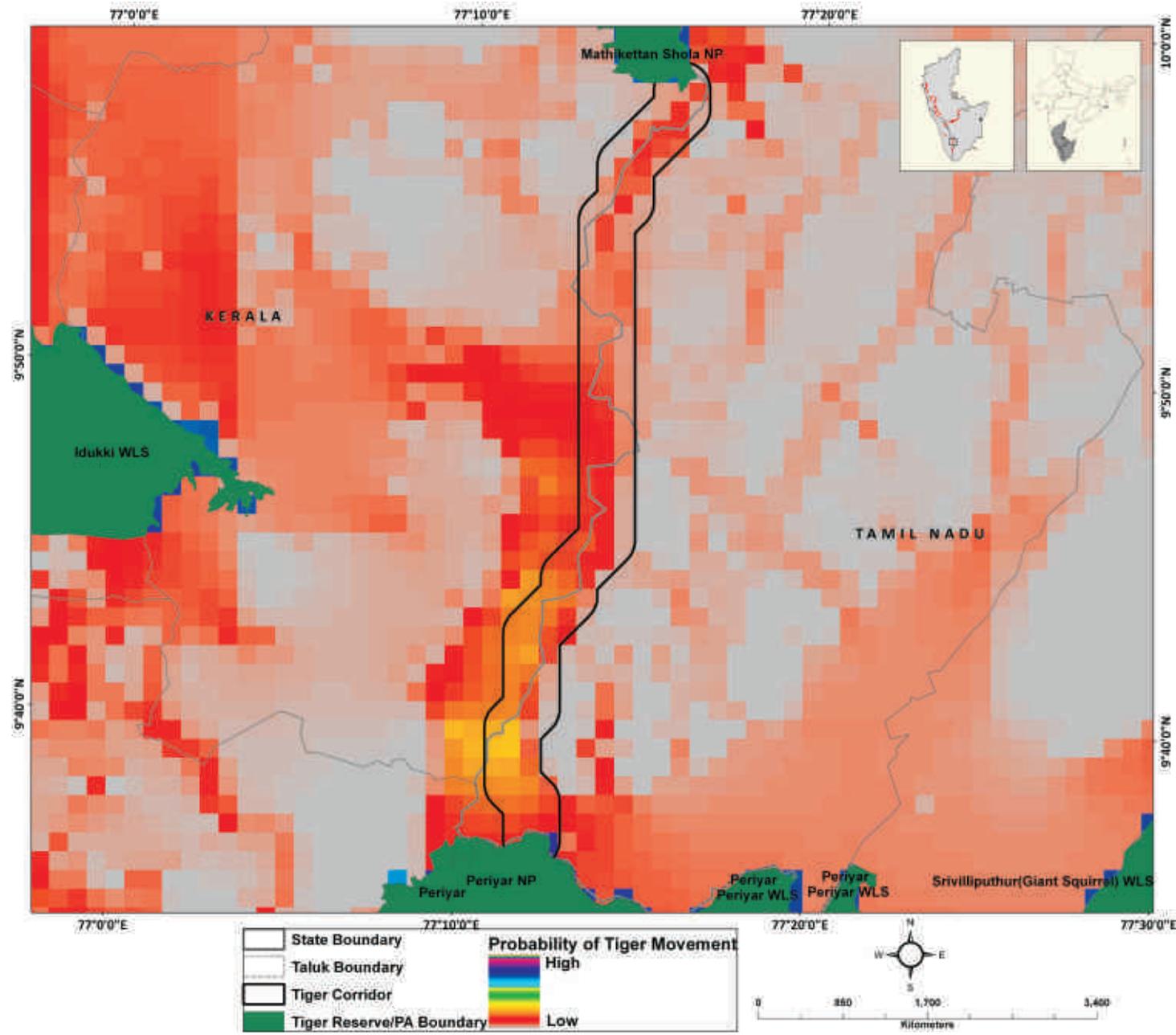
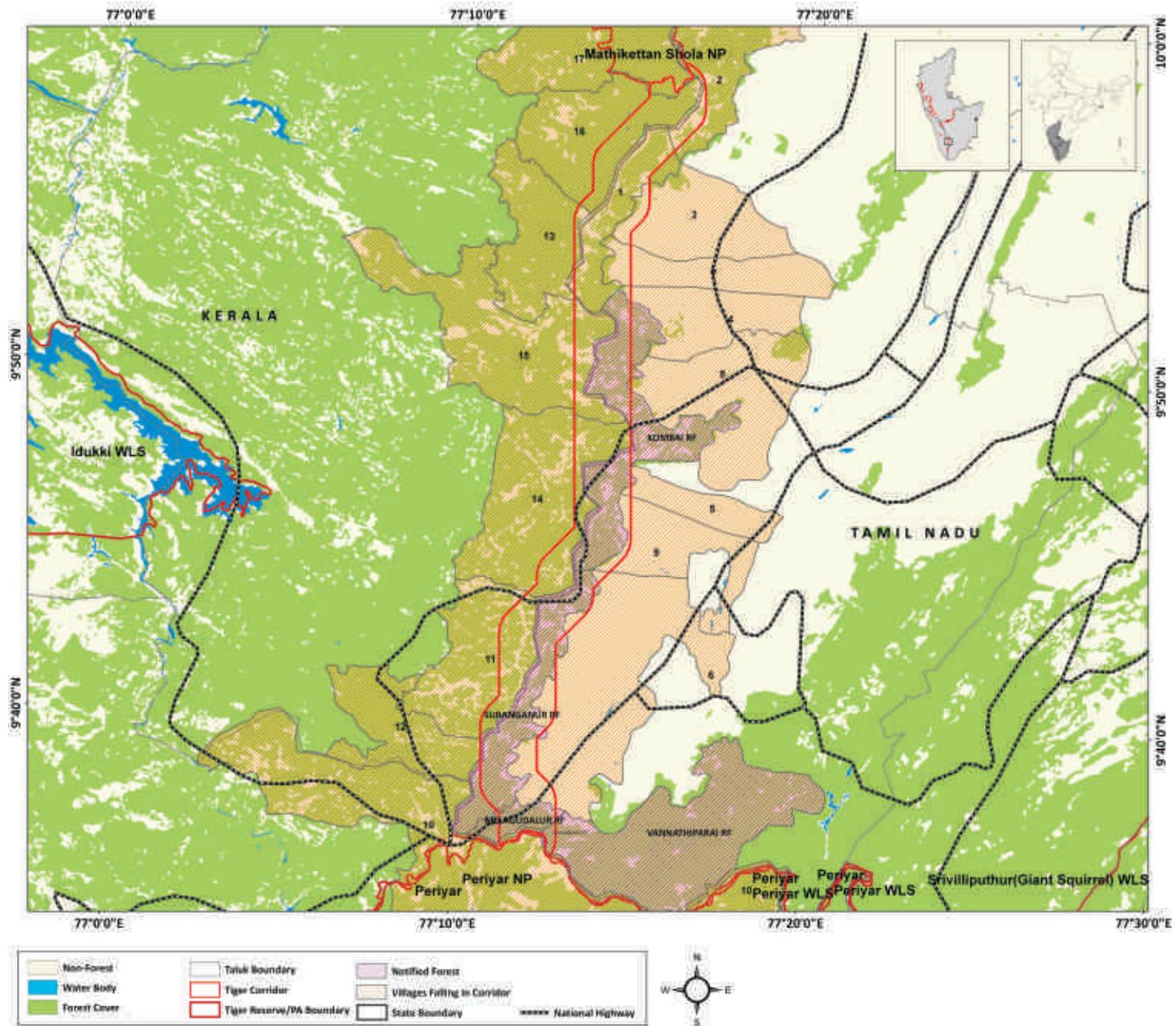


Figure 3.44:
Potential habitat connectivity for tiger movement between Mathikettan-Periyar Corridor as depicted by CIRCUITSCAPE model

Figure 3.45:

Least Cost Pathway corridor for tiger movement between Mathikettan-Periyar overlaid with village map (the village numbers are referenced in Table 3.10)



| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|----------|---------------|-----------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | Theni | Uthamapalayam | Thevaram Hills | NA | NA | NA | NA |
| 2 | | | Bodinayakanur | Bodi Hill West | NA | NA | NA | NA |
| 0 | | | Uthamapalayam | Vannathiparai Rf | 165 | 477 | NA | NA |
| 3 | | | Uthamapalayam | Thevaram A/d | 3549 | 14637 | 4225 | 16079 |
| 4 | | | Uthamapalayam | Pannaipuram A/c | 1924 | 8347 | 2311 | 9323 |
| 5 | | | Uthamapalayam | Pudupatti | 2537 | 10015 | 191 | 730 |
| 6 | | | Uthamapalayam | Gudalur (TN-2) | 9308 | 35531 | 12001 | 41915 |
| 0 | | | Uthamapalayam | Kombai Rf | NA | NA | NA | NA |
| 0 | | | Uthamapalayam | Suranganur Rf | NA | NA | NA | NA |
| 0 | | | Uthamapalayam | Melagudalur Rf | NA | NA | NA | NA |
| 7 | | | Uthamapalayam | T. Meenakshipuram A/b | NA | NA | NA | NA |
| 8 | | | Uthamapalayam | Kobai East And West | NA | NA | NA | NA |
| 9 | | | Uthamapalayam | Uthampuram A/c | NA | NA | NA | NA |
| 10 | Kerala | Idukki | Udumbanchola | Kumily | 6666 | 28652 | 7404 | 30276 |
| 11 | | | Udumbanchola | Anakkara | 5523 | 23934 | 5214 | 24699 |
| 12 | | | Udumbanchola | Chakkupallam | 3039 | 12242 | 3429 | 12609 |
| 13 | | | Udumbanchola | Chathurangapara | 1481 | 5325 | 1306 | 4177 |
| 14 | | | Udumbanchola | Karunapuram | 7426 | 31981 | 7571 | 30473 |
| 15 | | | Udumbanchola | Parathodu | 5316 | 21525 | 5444 | 20417 |
| 16 | | | Udumbanchola | Santhanpara | 2211 | 8425 | 1985 | 6782 |
| 17 | | | Udumbanchola | Poopara | NA | NA | NA | NA |

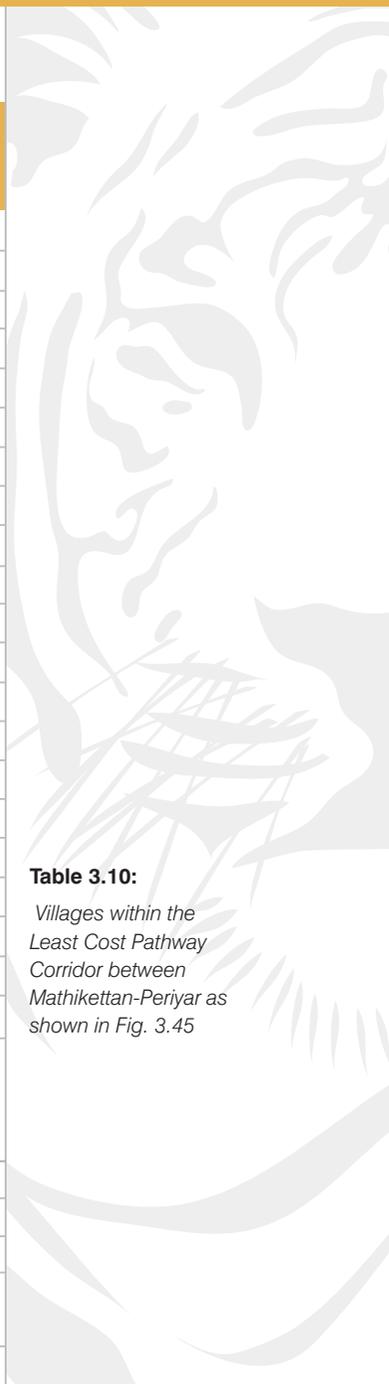


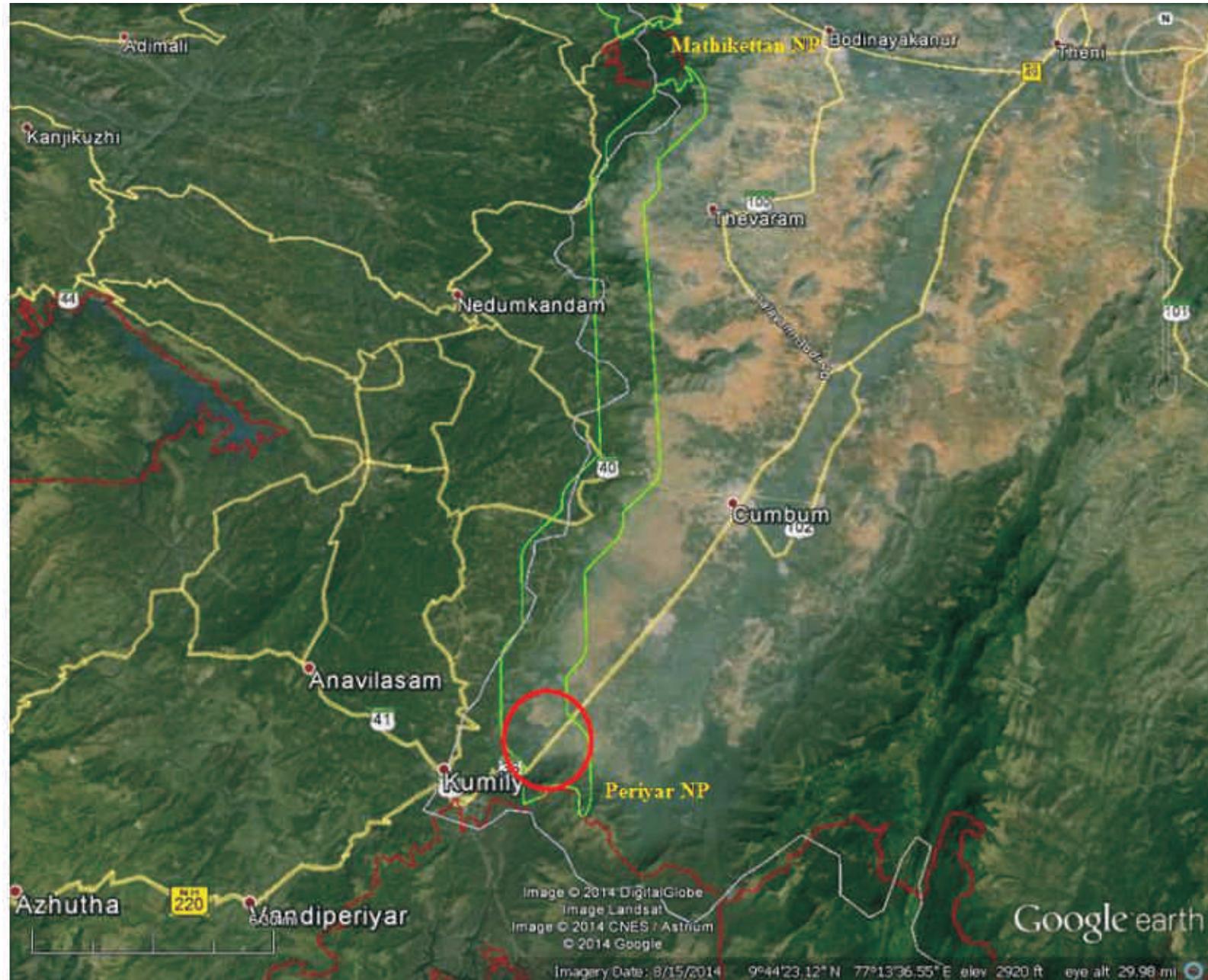
Table 3.10:
Villages within the
Least Cost Pathway
Corridor between
Mathikettan-Periyar as
shown in Fig. 3.45

Mathikettan-Periyar Corridor

| | |
|--------------------------|---|
| Habitat size | 13233 Km ² |
| Source Population | KMTR-Periyar |
| Size of Source | 38 (36-40) tigers in 3812 Km ² |
| Protected Areas | Mathikettan Shola NP Periyar WLS |
| Corridors | Periyar WLS-Mathikettan Shola NP Corridor |

Figure 3.46:

Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mathikettan-Periyar



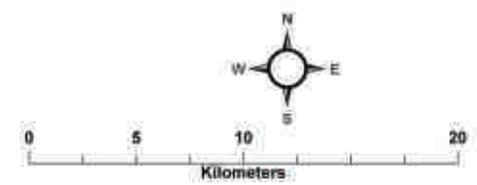
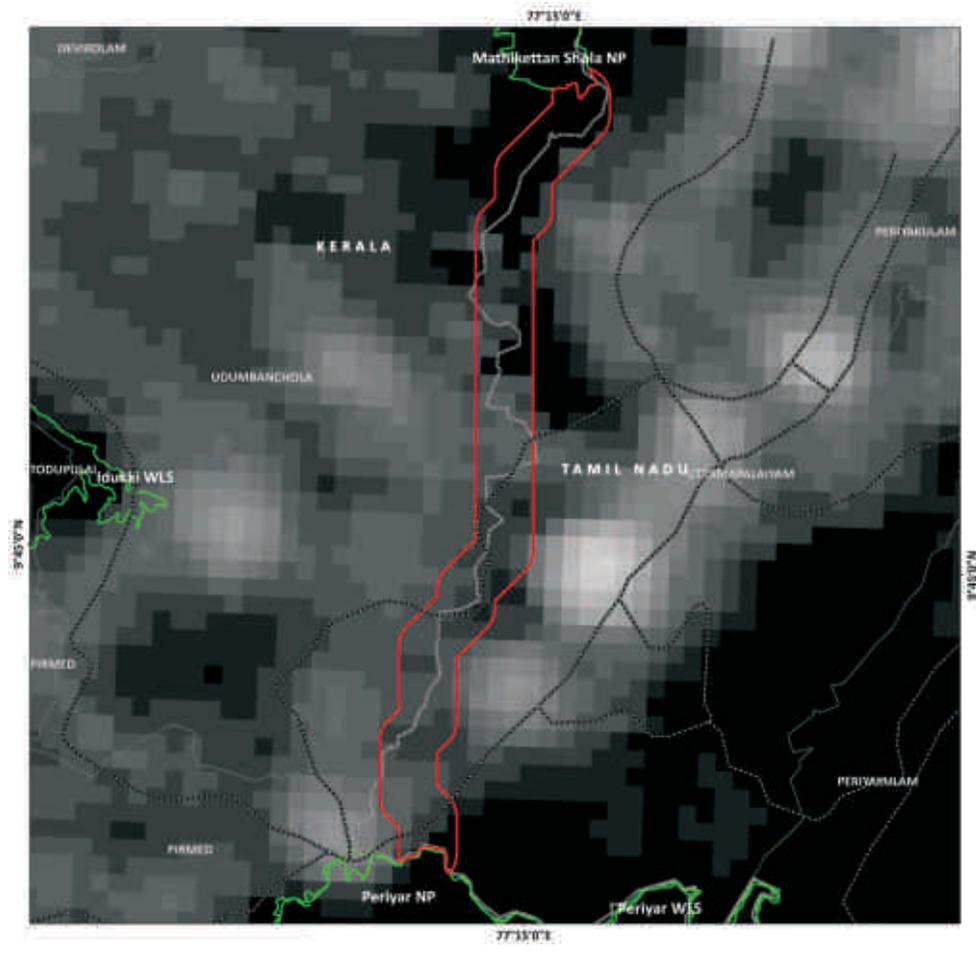
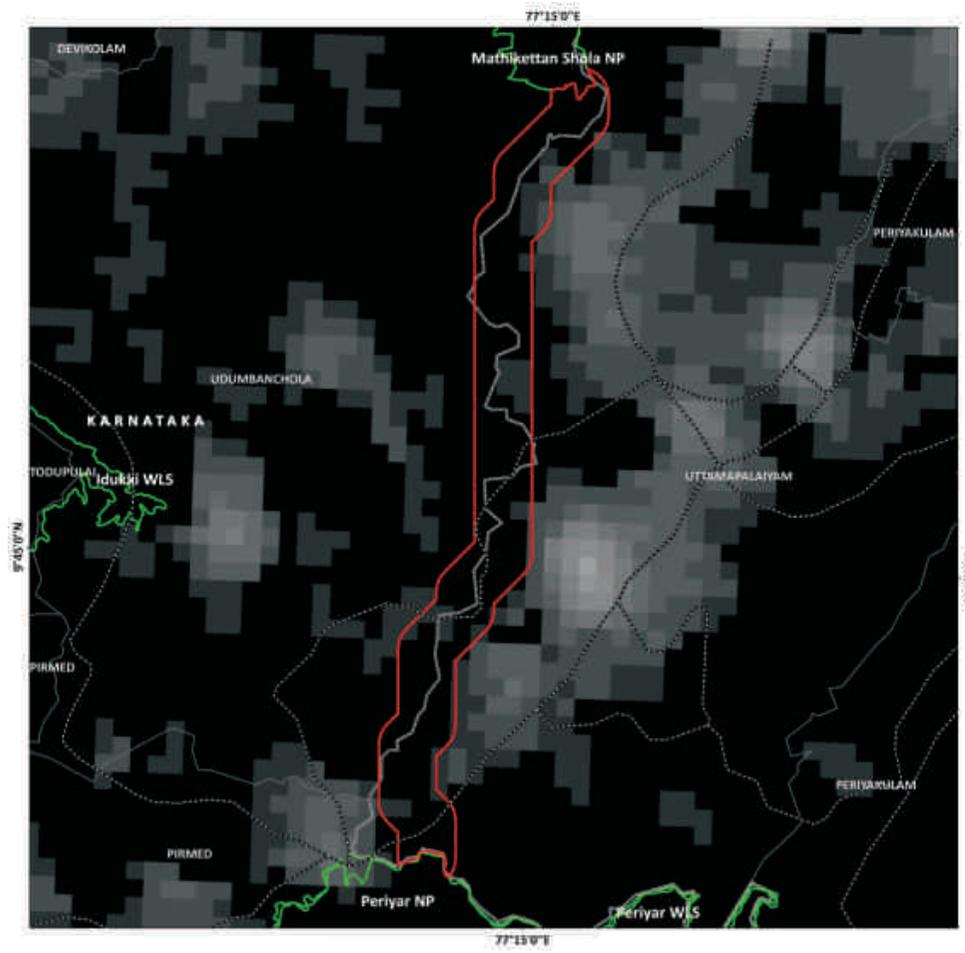
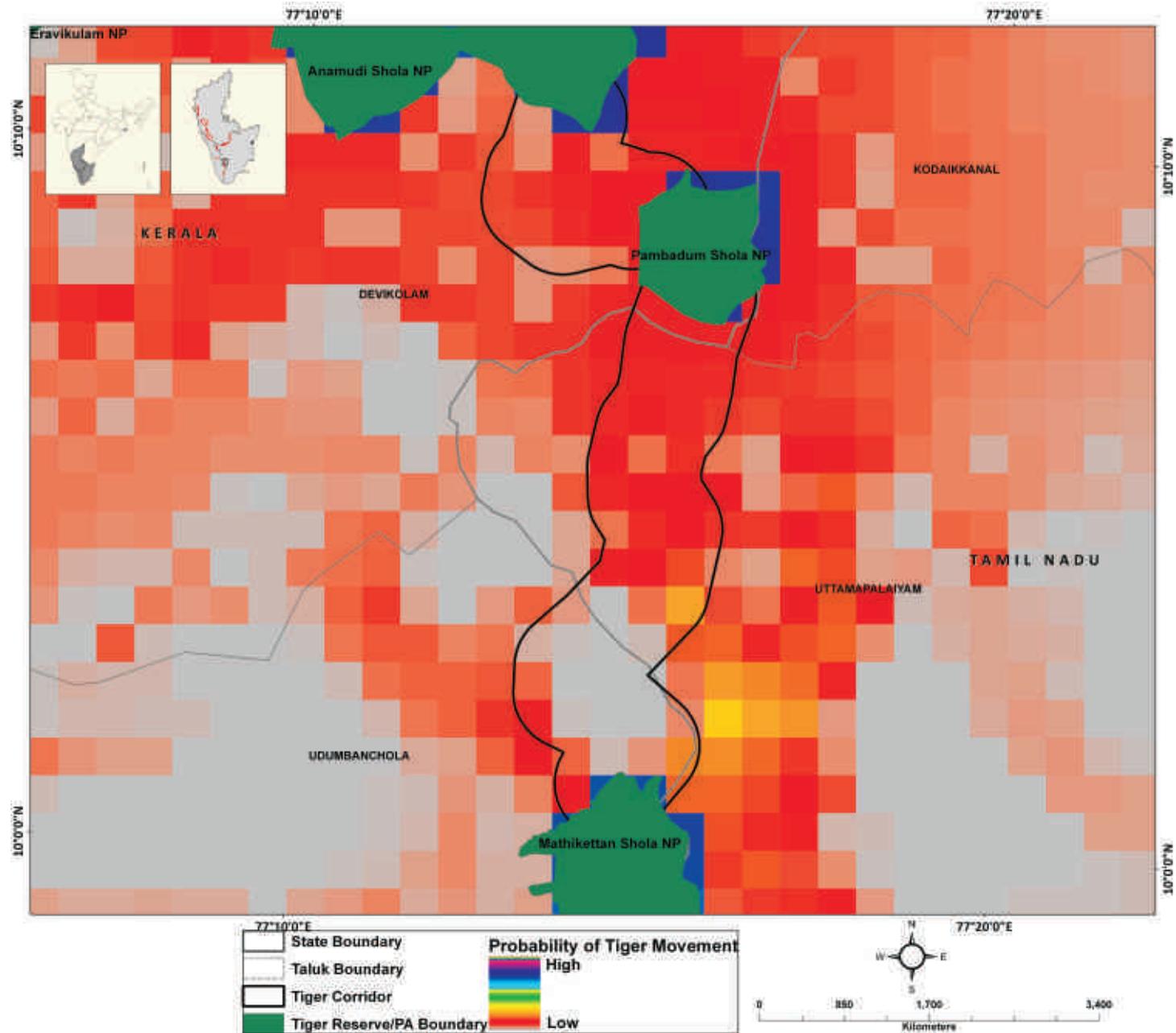


Figure 3.47:
Human habitation as depicted by nightlights within the Mathikettan-Periyar landscape in the year 1992 and 2012

Figure 3.48:

Potential habitat connectivity for tiger movement between Mathikettan Shola NP-Pambadum Shola NP-Pambadum Shola NP-Anamudi Shola NP as depicted by CIRCUITSCAPE model



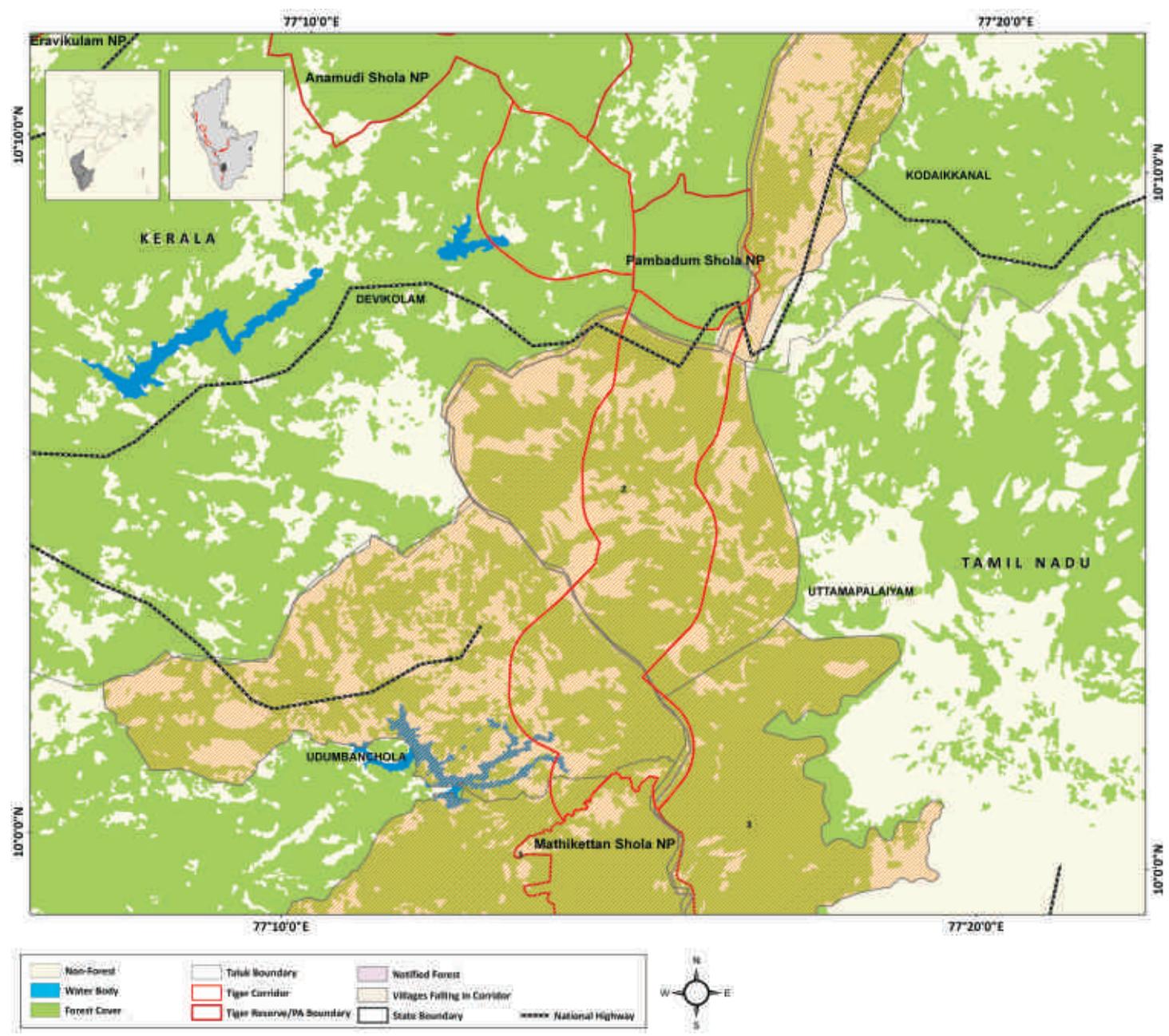


Figure 3.49: Least Cost Pathway corridor for tiger movement between Mathikettan Shola NP- Pambadum Shola NP- Anamudi Shola NP overlaid with village map (the village numbers are referenced in Table 3.11)

*Partial village information for Kerala, falling within the corridor was unavailable

Table 3.11:

Villages within the Least Cost Pathway Corridor between Mathikettan Shola NP-Pambadum Shola NP-Anamudi Shola NP as shown in Fig. 3.49

| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|----------|---------------|----------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | Dindigul | Kodaikanal | Mannavanur | 1437 | 5927 | 2223 | 8117 |
| 2 | Tamil Nadu | Theni | Bodinayakanur | Kottagudi | 557 | 1912 | 910 | 3272 |
| 3 | Tamil Nadu | Theni | Bodinayakanur | Bodi Hill West | NA | NA | NA | NA |
| 4 | Kerala | Idukki | Udumbanchola | Chinnakanal | 3095 | 12949 | 3210 | 12005 |
| 5 | | | Udumbanchola | Poopara | NA | NA | NA | NA |

Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP Corridor

| | |
|--------------------------|---|
| Habitat size | 13233 Km ² |
| Source Population | KMTR-Periyar |
| Size of Source | 38 (36-40) tigers in 3812 Km ² |
| Protected Areas | Mathikettan Shola NP Pambadum Shola NP Anamudi Shola NP |
| Corridors | Mathikettan Shola NP-Pambadum Shola NP Pambadum Shola NP-Anaimudi Shola NP |



Figure 3.50:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP

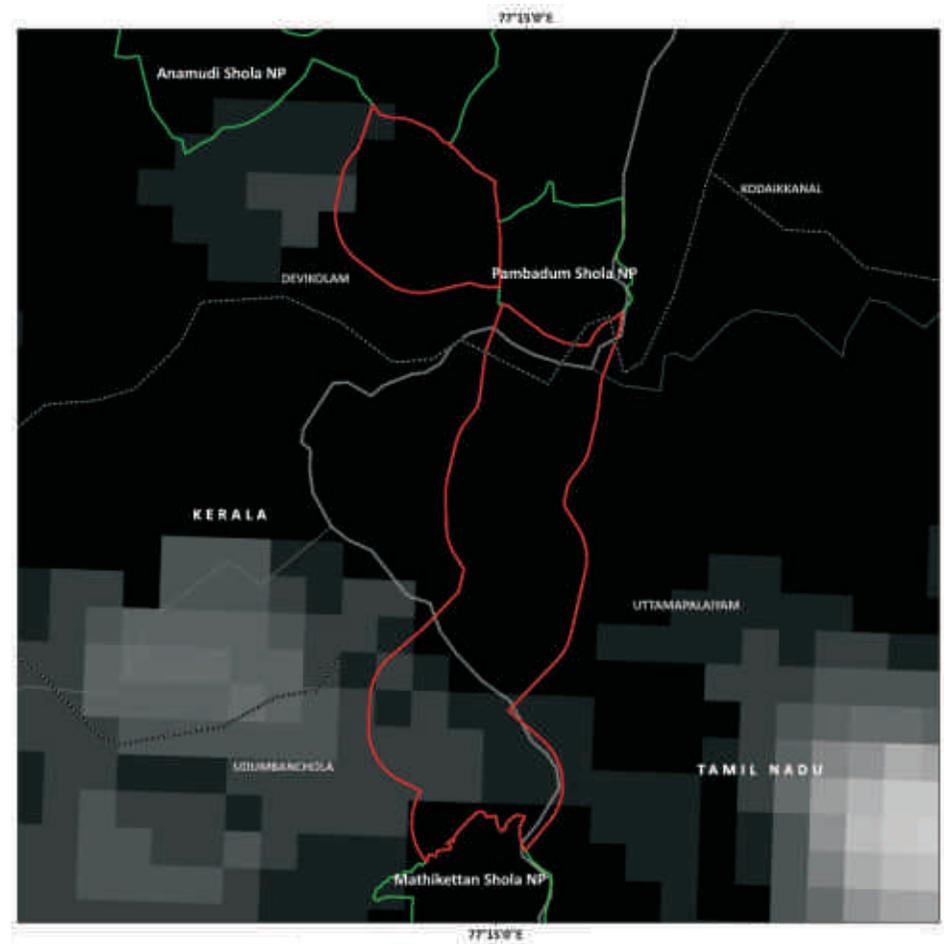
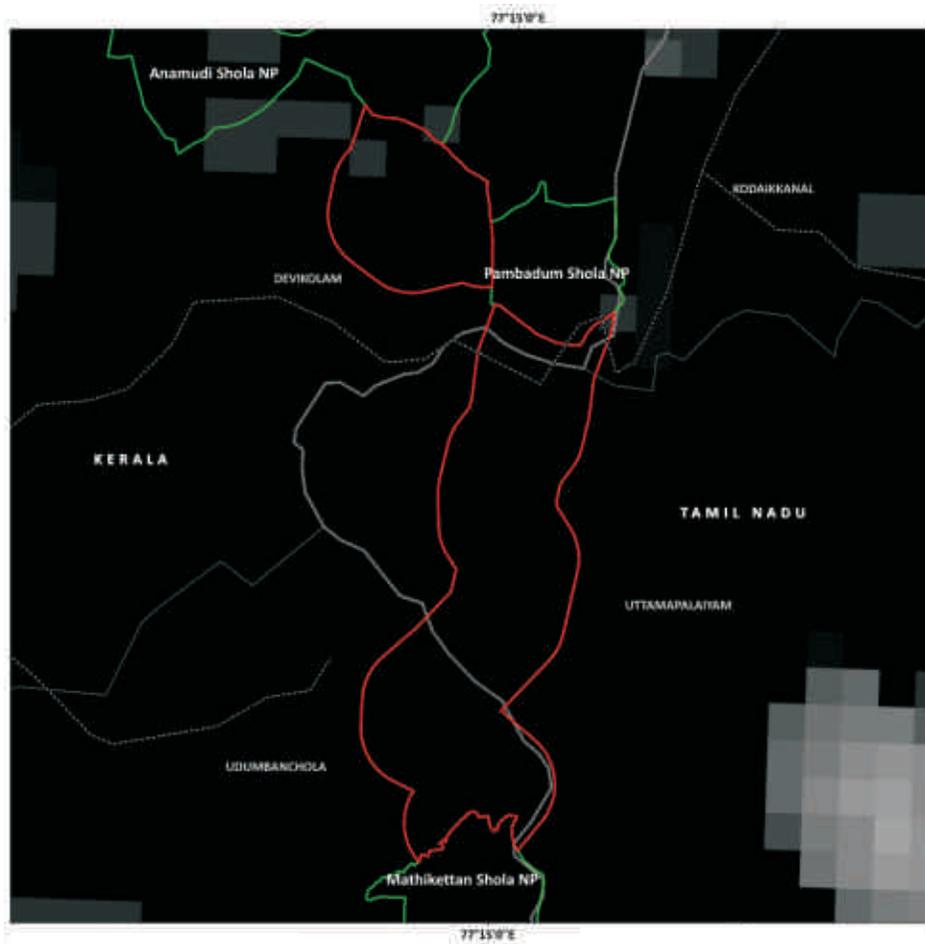
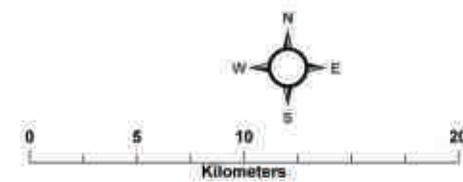


Figure 3.51:

Human habitation as depicted by nightlights within the Mathikettan Shola NP-Pambadum Shola NP-Anaimudi Shola NP landscape in the year 1992 and 2012



KALAKAD-MUNDANTHURAI-PERIYAR

This complex extends from Periyar Tiger Reserve in Kerala and is contiguous with Peppara Wildlife Sanctuary in Nedumangad taluka of Trivandrum and Neyyar Wildlife Sanctuary in Neyyattinkara taluka of Trivandrum district. Shendurney Wildlife Sanctuary is located in Pathanapuram district of Kollam. All three of these Protected Areas are contiguous with Kanyakumari Wildlife Sanctuary and Kalakad-Mundanthurai Tiger Reserve in Tamil Nadu. This landscape has tiger occupancy in about 2,121 km² with an estimated tiger population between 36 and 40. The connectivity between Periyar complex and the Protected Areas to the south of Periyar are an essential element for long term tiger persistence within this landscape complex. The corridor identified by the Least Cost Pathway traverses hilly forested terrain, interspersed by plantations and habitation. It meets major barriers to wildlife movement near the township of Aryankavu in the form of high human densities, road and rail traffic. Mitigation measures need to be implemented here to maintain the wildlife value of this corridor.

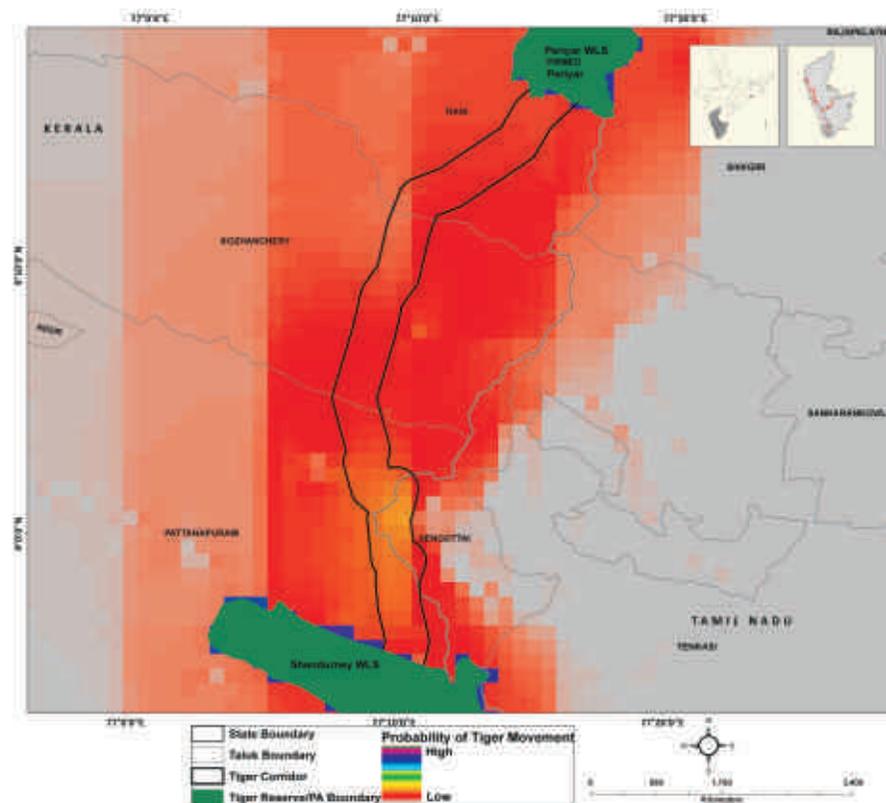


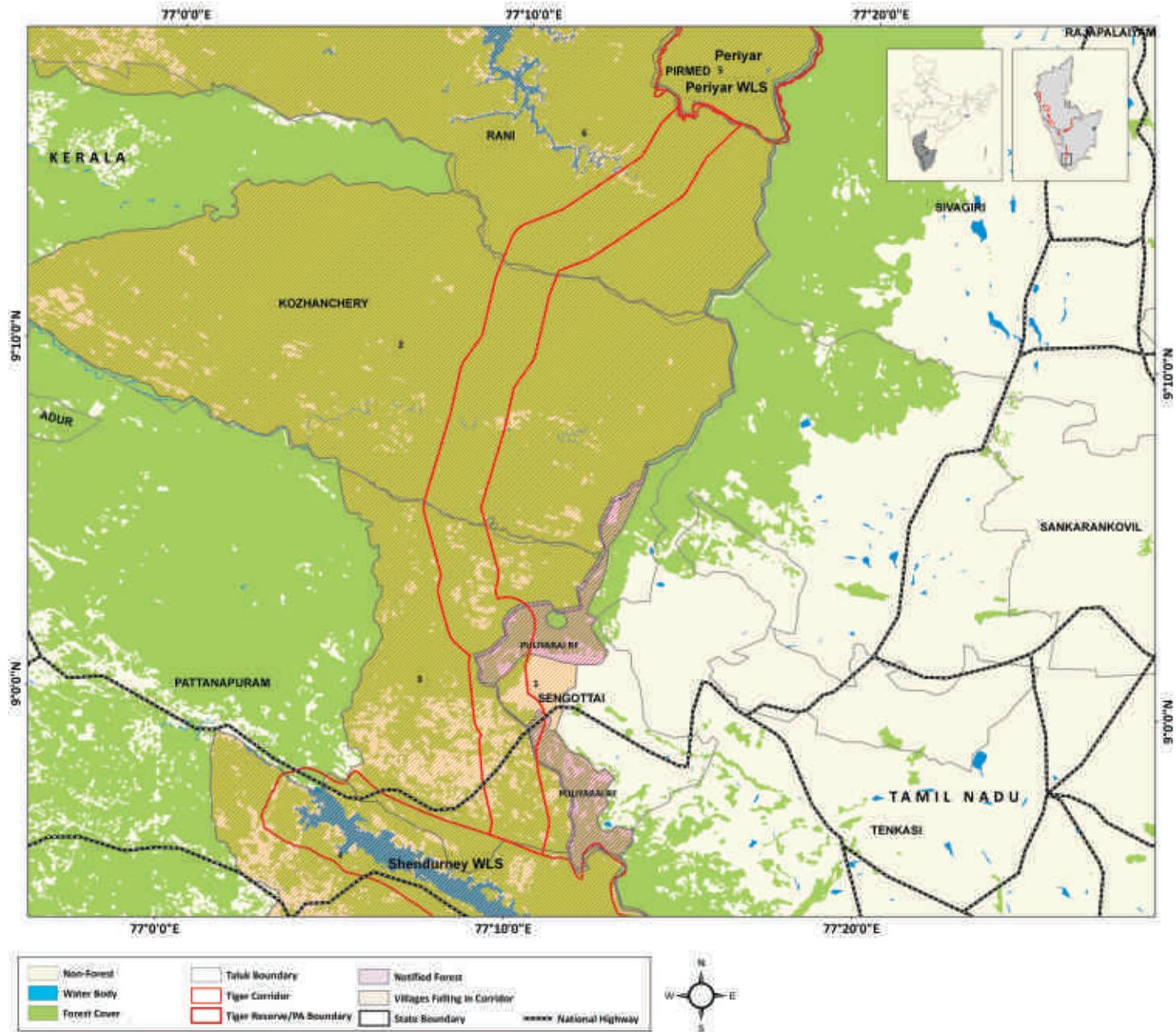
Figure 3.52: Potential habitat connectivity for tiger movement between Periyar-Shendurney WLS as depicted by CIRCUITSCAPE model

Periyar-Shendurney WLS Corridor

| | |
|--------------------------|---|
| Habitat size | 13233 Km ² |
| Source Population | KMTR-Periyar |
| Size of Source | 30 (36-40) tigers in 3812 Km ² |
| Protected Areas | Periyar WLS Shendurney WLS |
| Corridors | Periyar WLS-Shendurney WLS |

Figure 3.53:

Least Cost Pathway corridor for tiger movement between Periyar-Shendurney WLS overlaid with village map (the village numbers are referenced in Table 3.12)



| Village_ID | State | District | Tehsil | Village | No of Household (2001) | Total Population (2001) | No of Household (2011) | Total Population (2011) |
|------------|------------|---------------|--------------|---------------------|------------------------|-------------------------|------------------------|-------------------------|
| 1 | Tamil Nadu | Tirunelveli | Shenkottai | Puliyarai A/b | NA | NA | NA | NA |
| 2 | Kerala | Pattanamtitta | Kozhanchery | Aruvappulam | 4039 | 16183 | 3872 | 13801 |
| 3 | | Quilon | Pattanapuram | Arienkavu | 3162 | 12125 | 2910 | 10144 |
| 4 | | | Pattanapuram | Kulathupuzha | 3519 | 14749 | 4145 | 15931 |
| 5 | | Idukki | Pirmed | Mlappara | 307 | 1125 | 314 | 1129 |
| 6 | | Pattanamtitta | Rani | Chittar-Seethathodu | 8405 | 33977 | 8722 | 31969 |

Table 3.12:
Villages within the Least Cost Pathway Corridor between Periyar-Shendurney WLS as shown in Fig. 3.53



Figure 3.54:
Potential bottlenecks, obstacles and weak links within the Least Cost Pathway corridor connecting Periyar-Shendurney WLS

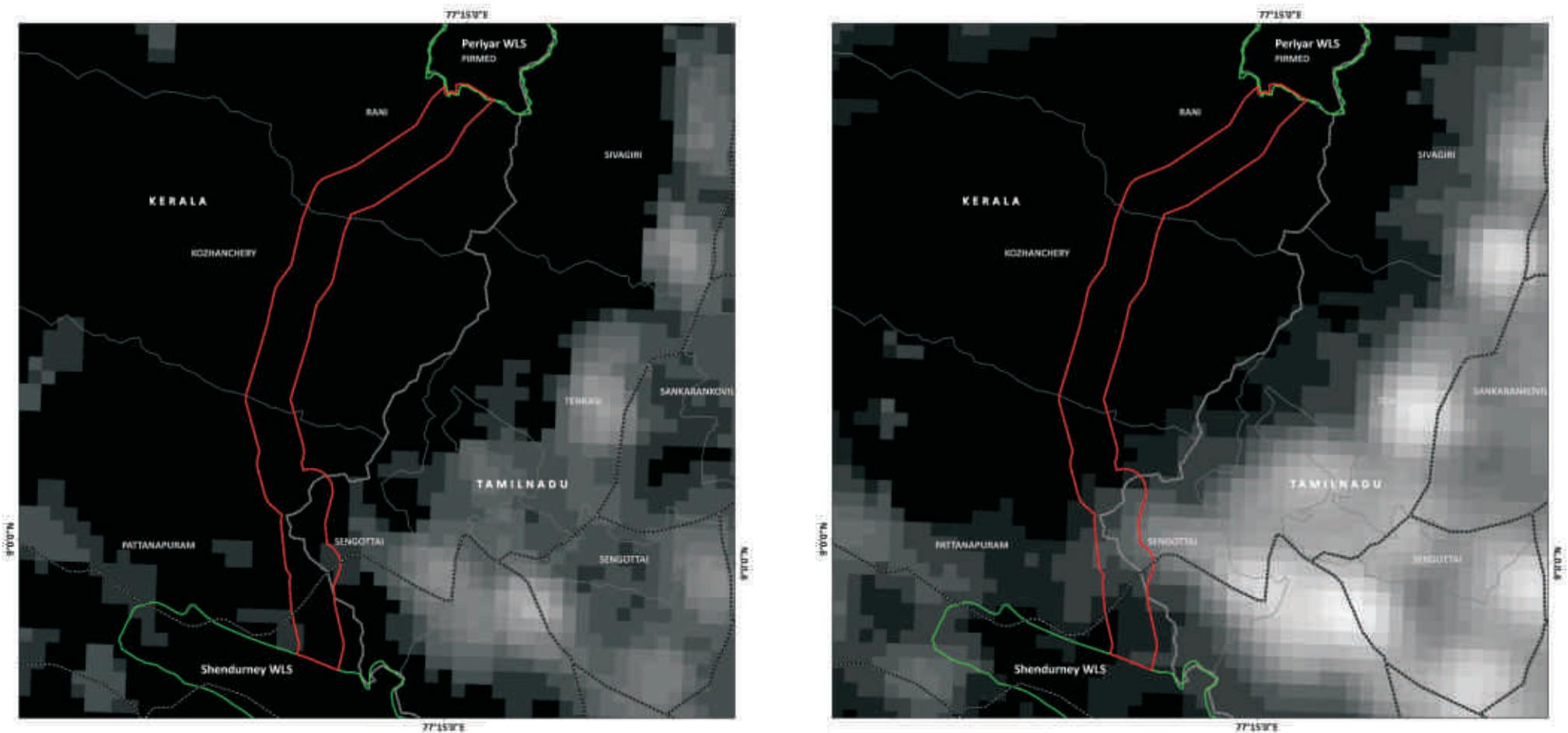


Figure 3.55:
Human habitation as depicted by nightlights within the Periyar-Shendurney WLS landscape in the year 1992 and 2012

