

“MSTrIPES”

Monitoring System for Tigers – Intensive Protection & Ecological Status

Field Protocols & Customized Software for Analysis, Mapping & Inference



**National Tiger Conservation Authority
Wildlife Institute of India
Zoological Society of London**

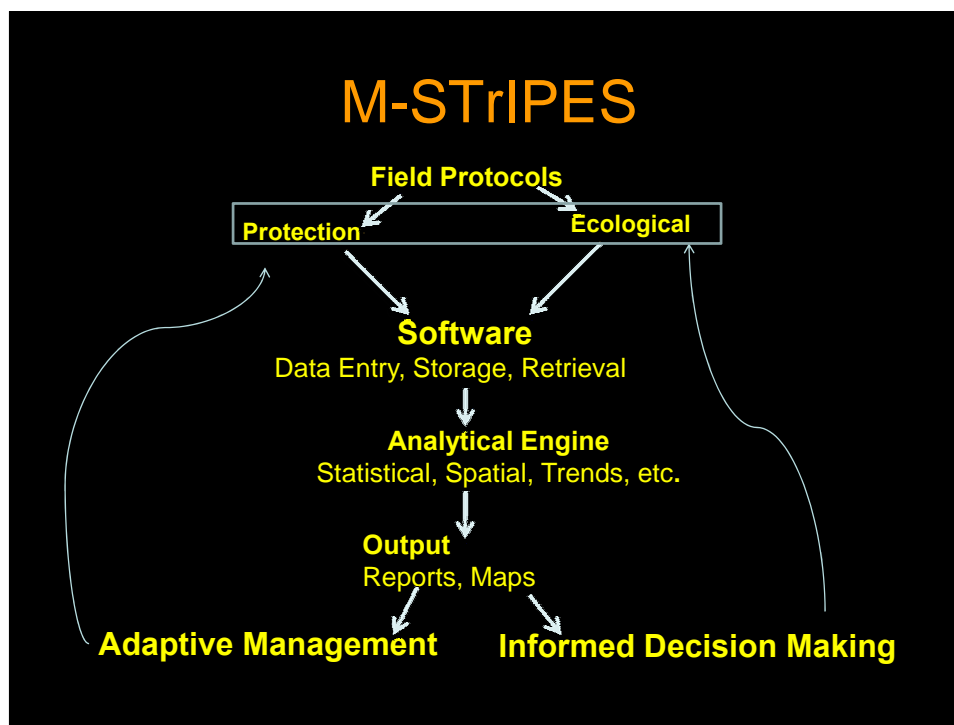
Aims



- Assist in Effective Patrolling & Protection
- Evaluate Status & Trends of Carnivores & Ungulates at Regular Intervals
- Monitor Habitat Change
- Evaluate Human Pressures
- Generate Reports to Provide Quantitative Information for Management Effectiveness Assessment and Decision Making

System Features

- Provide user friendly Field Protocols (inc training and material, data quality control), Data Storage and Report Generating Tool
- Administered and maintained at protected areas, landscapes, States and NTCA
- Captures detailed information on population status and trends, animal mortality, illegal activity, human pressures, patrol effort, habitat status for monitoring and guiding management
- Provides a comprehensive GIS and statistical tool for processing and reporting information needed for conservation and management purposes



Field Protocols & Equipment

- Phase I Data collection
 - Carnivore Sign Survey
 - Ungulate Line Transect
 - Human Pressure Assessment on Plots on Transects
 - Ungulate Dung on Plots on Transects
 - Habitat Status on Plots on Transects
- Fixed Location PIP's (track plots) for Tigers (min. 5 in each beat monitored once a week)
- GPS Units (or PDA's) and Data Collection Forms
- Training of Tiger Reserve Staff in Data Collection and Software Entry

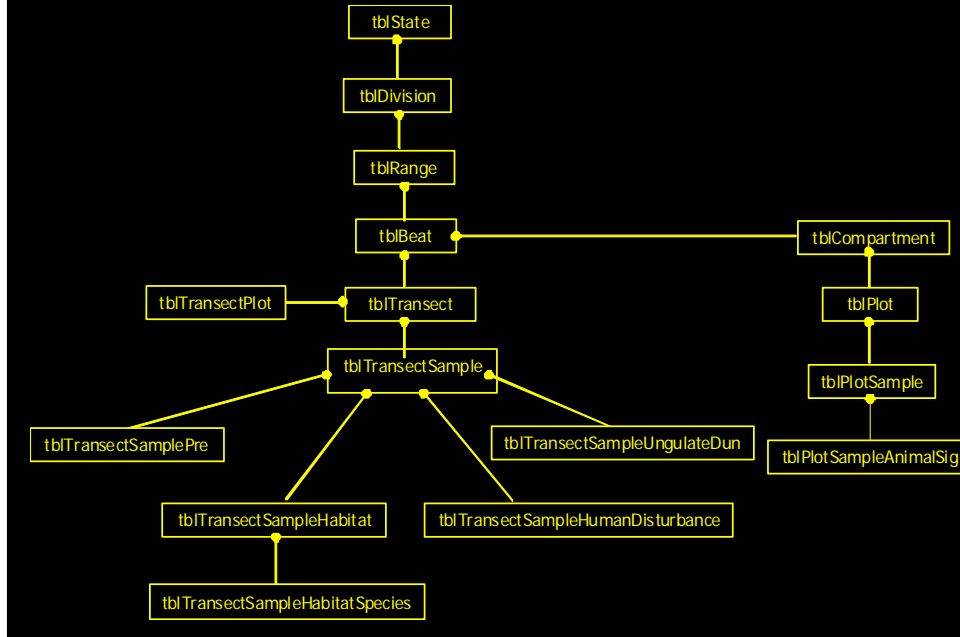


Tiger / Carnivore Sign Survey

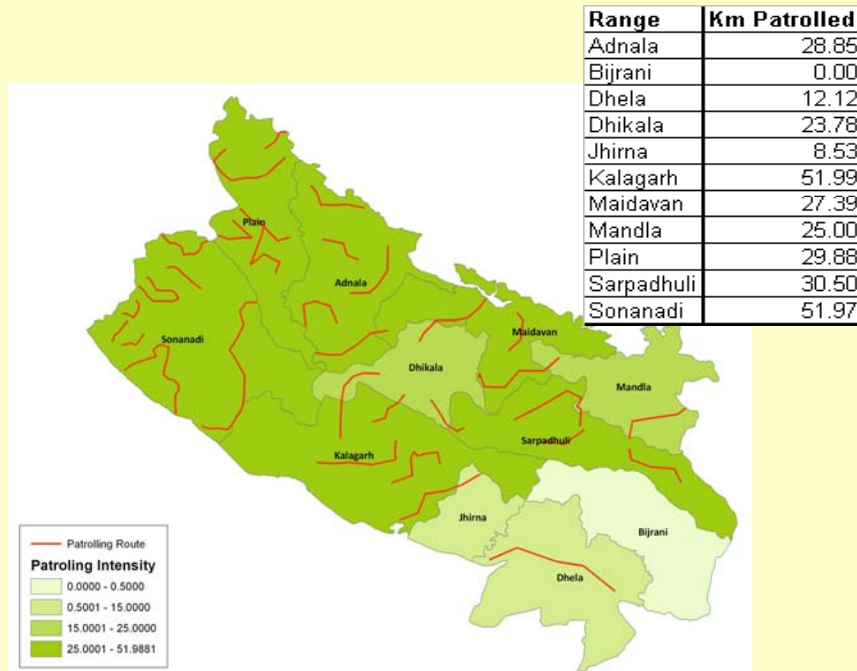


- Intensive search for tiger / carnivore sign
- 3-5 searches each of 4-8 km
- Minimum 15 km search in most likely areas in each Beat
- Record distance covered and time spent in each search

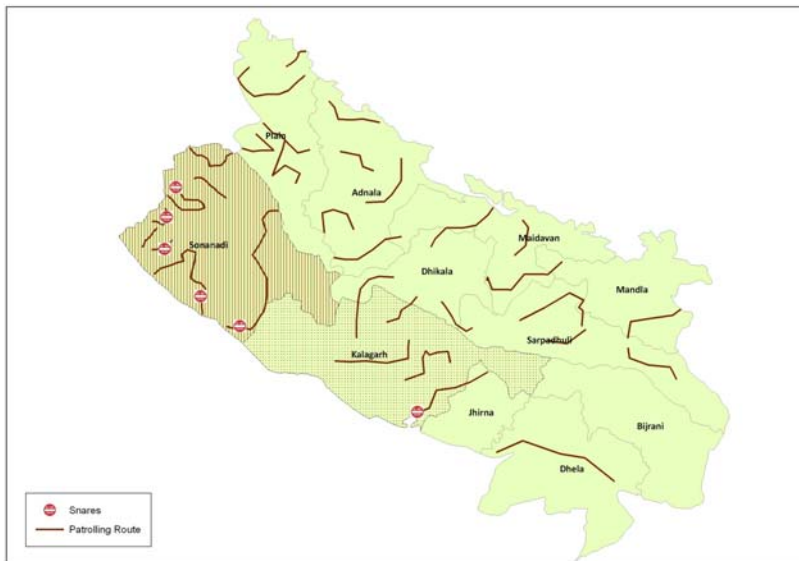
An entity relationship diagram



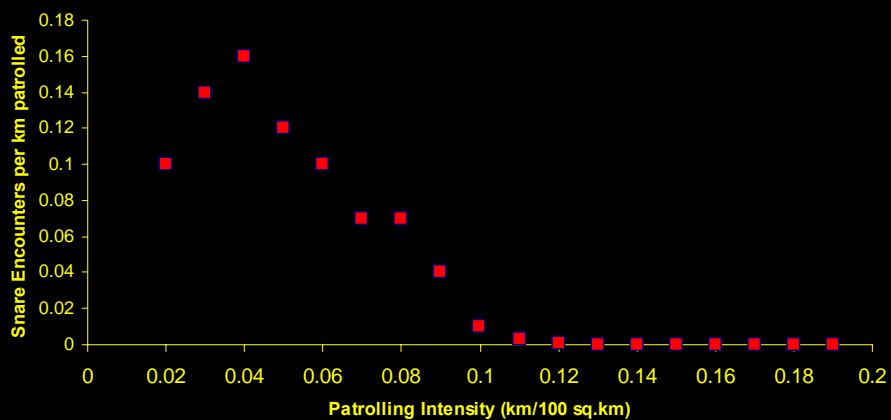
Patrolling Intensity & Spatial Coverage in Corbett TR

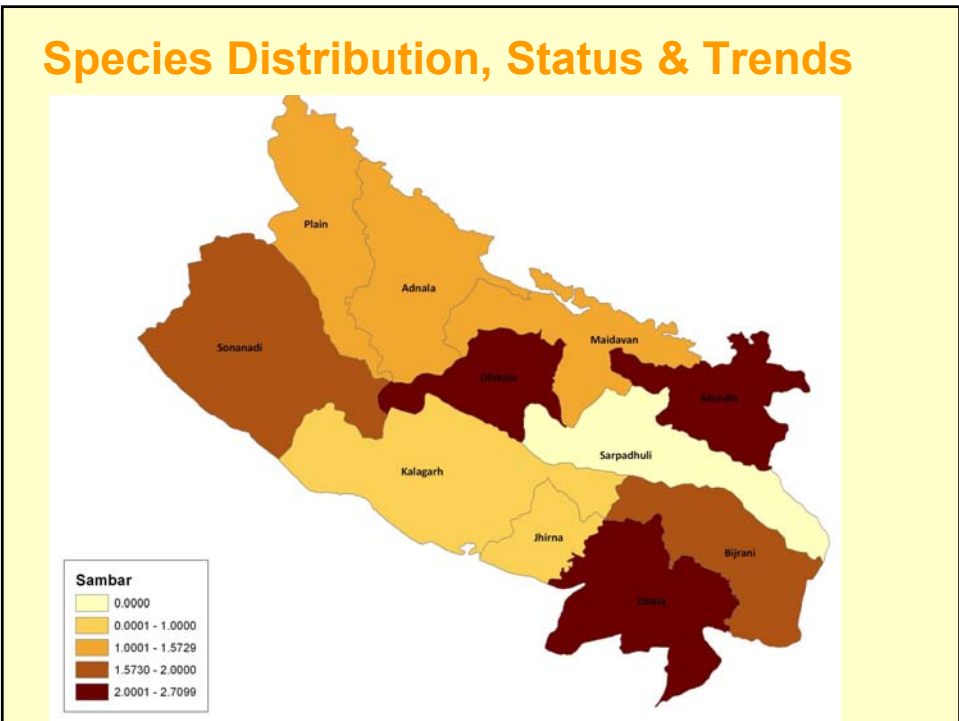
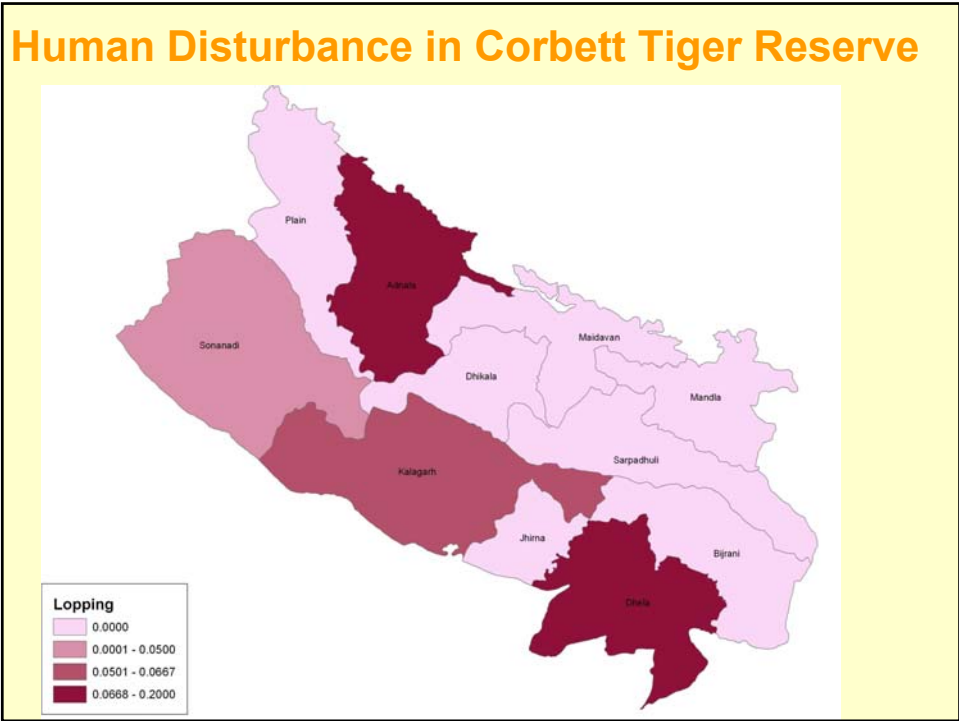


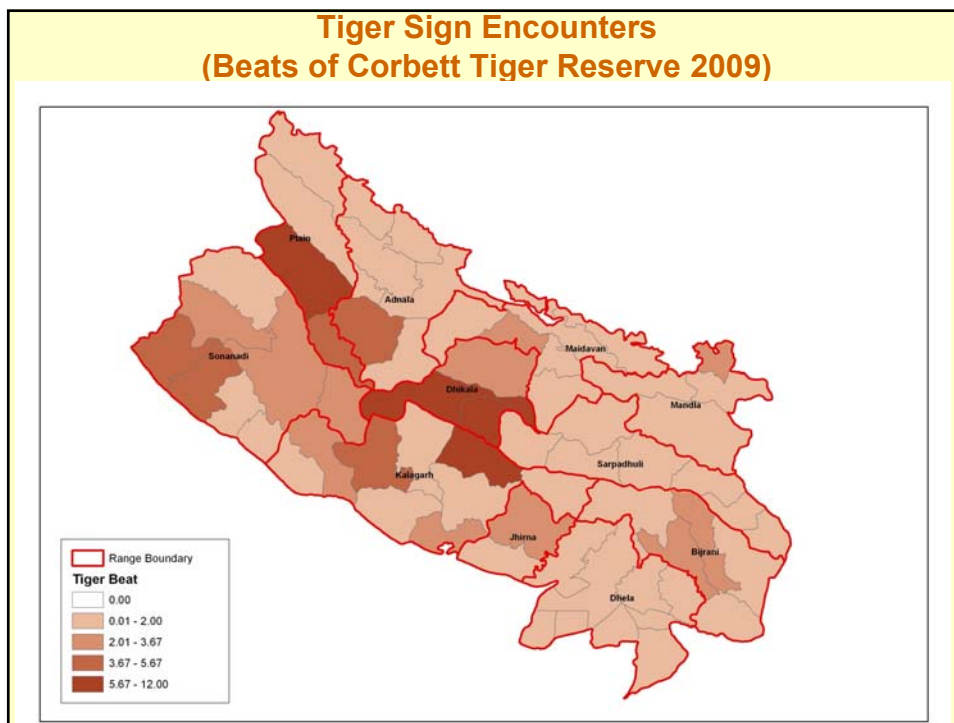
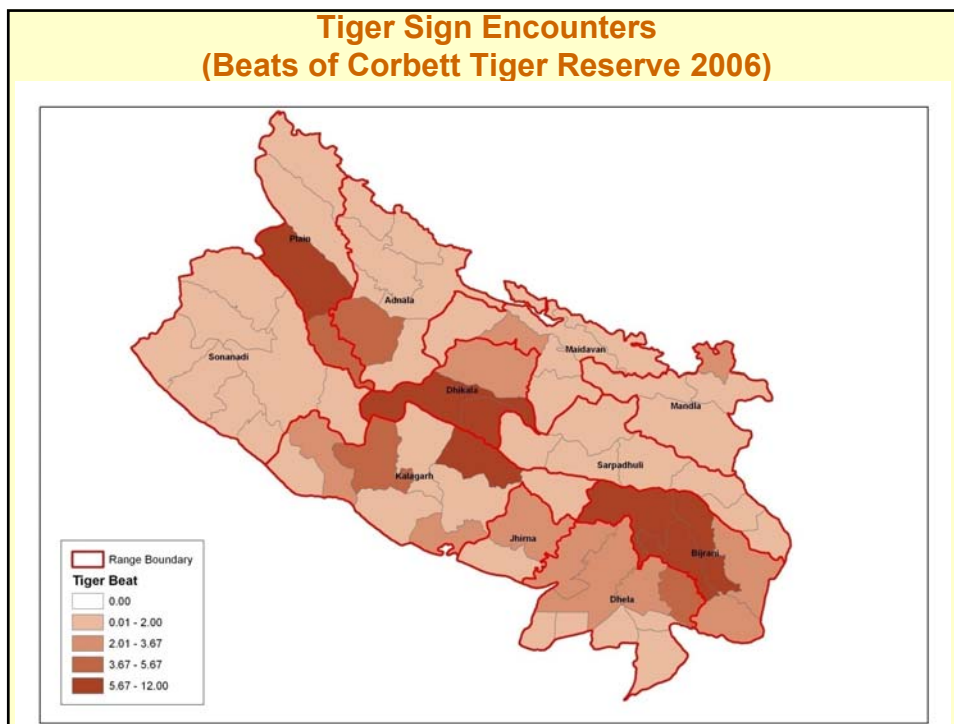
Spatial Mapping and Trends of Illegal Activities



Patrolling Intensity VS Illegal Activities



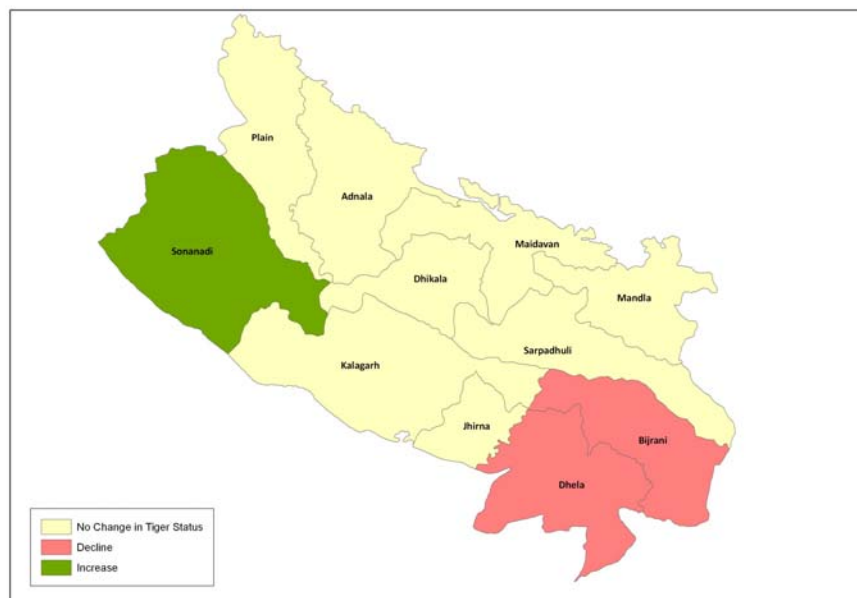




System Process

- Computes adequacy of sampling effort and advises to sample more if required statistical power is not achieved
- Conduct Spatially Paired Statistical Comparisons
- Conduct Trend Analysis (Regression)
- Interpret Results at Appropriate Spatial Scales (Beat, range, 10x10 km Grid, Circle and State) both Statistically and Biologically
- Output User Friendly Results as Maps and Tables

System Output – Tiger Status Change in Corbett



Tables for Carnivore Occupancy Estimates

Spatial Scale	Occupancy estimates (Season / Year)				
	Tiger	Leopard	Dhole	Hyena	Etc...
Beat ID-1	0.10	0.09	0.10	0.09	...
Beat ID-2	0.12	0.05	0.12	0.05	...
Beat ID-3	0.07	0.09	0.07	0.09	...
Beat ID-4	0.06	0.34	0.06	0.34	...
Beat ID-5	0.03	0.23	0.03	0.23	...
Beat ID-6	0.18	0.14	0.18	0.14	...

Tables for Changes in Carnivore Occupancy

Spatial Scale	Change in Occupancy (Year 1 – Year 2)				
	Tiger	Leopard	Dhole	Hyena	Etc...
Range 1	↓	↔	↓	↓	...
Range 2	↔	↑	↔	↓	...
Range 3	↔	↔	↔	↔	...
Range 4	↔	↔	↔	↔	...
Range 5	↔	↔	↔	↔	...

↓ = > -20% negative change
 ↑ = > +20% positive change
 ↔ = > no significant change
 ↑ = no sighting data

Applications

- Monitoring population status, trends, and spatial occupancy
- Mapping of illegal activities and their trends
- Guiding Park Management for patrolling - spatially and in intensity
- Mapping and trend analysis of human impacts
- Understanding interrelations between above parameters
- Export of data for in-depth analysis in desired format
- Entry, Analysis, Interpretation, and use of Phase I data at field level
- Ready reports at desired spatial & temporal scales and for evaluating management effectiveness and guiding decision and policy making