



Supplement to Khan 2012 - Technological enhancements needed in photo-trap approach for forthright use by tiger population managers

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The fundamental lesson given to budding Wildlife Managers of 1970s was that if they were sure about the continued existence of a healthy population of predator (tiger) at the apex of the ecological pyramid they may draw a logical conclusion that the herbivore and the vegetative habitat forming the lower strata of the pyramid were also in sound conditions. If correctly implemented the status of large cats can indeed be accurately assessed while it is not within possible reach of such order for herbivores or the vegetation. This is true even today.

In the year 1972 the first All India Tiger Census was carried out by pugmark tracking (Choudhury 1970). Thereafter census of tiger has been carried out at intervals and based on the results and experiences of field experts at least 39 areas in India have been identified for conservation of tiger and its habitat. Also in this process, a series of management prescriptions have been implemented because of which tiger still survives in the wild (MOEF-Government of India 2006). 'Pugmark Tracking' (Singh 1999, 2000) continued to be the accepted method for studying large cats in India until 2004. It was also used in Bangladesh (MOEF-Bangladesh 2004) and Sri Lanka (Kittle & Watson 2007).

There is no disagreement that abundance of large

felids is governed by the abundance of their prey communities (eg., Karanth & Nichols 1998), but the number of tigers determined by pugmark tracking lost trust with some as tigers were "not sighted" in the forest. At about this time incompletely trained persons were asked to interpret pugmark tracings or plaster casts. Besides, the level of implementation of pugmark tracking for large felid census varied in different parts of India. Finally there was one highlighted case where the actual results of the exercise were not revealed because of administrative or some other constraint. Ultimately, the foundation provided by all past census results from all places got discredited. It even ignored the arduous path that was covered from 1973 to mid 1990s for expanding tiger conservation network.

In spite of knowing well that photographing of tiger is not easy in dense forest a new wave of interest emerged with the people and researchers for producing photographic evidences of tigers in tiger reserves. In this context using camera-trap had the required potentiality.

Camera trap was not new for the wildlife fraternity. I give credit to Mr Howard Hunt of Atlanta Zoo who was identifying egg predators visiting nests of *Alligator mississippiensis* in Okefenokee Swamp National Wildlife Refuge, Georgia, USA. Howard monitored the alligator nests during 1976 to 1985 with Kodak Instamatic X-15 cameras set with mouse-trap shutter releases and mounted on stakes. The camera was connected to the nest mound with thread. Disturbance to the mound tripped the camera and a single photograph recorded each incident (Hunt 1987).

During mid 1990s demonstrations were made (Karanth 1995) and extensively popularized for possible use of camera traps to assess populations of tiger in India. With the support of National Tiger Conservation Authority, from the year 2005–06 camera-trap and a series of other field exercises have been implemented at the all-India level (Jhala et al. 2008, 2011).

The recent publication by Khan (2012) describes one such use of camera trap in Bangladesh. The application of photo-trap principle with extensively improved cameras and statistical extrapolation constitute a type of sample study. The technique is developing as an easier approach to deduce the minimum number of tigers in inhospitable areas or areas with low tiger density. The technique has been successful in creating a new wave

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of interests for tiger conservation. It has drawn wide attention among intelligentsia, the researchers and media as it produces photographs of tigers.

However, considering the presently low level of field-utility for tiger managers, the sampling method using photo traps under discussion needs to be improved. The results from the method have to rise above the academic look and be more meaningful for forthright use by Tiger Population Managers and the staff who are in-charge of protecting and conserving tigers and their territories. The staff should be able to know the continued presence of tiger during their own day to day field activities. Statistical extrapolation of sampled 'photographic results' is unable to ascribe this important task.

As an example, the study (Khan 2012) involved 290 field days spanned over a period of two years, and it could conclude, from seven photographs, the presence of five tigers, which is 2.5% of the estimated minimum population of 200 tigers. To a small number of identified tigers addition was made of statistically deduced virtual tigers to the extent of 97.5% of the population.

Photographing a tiger with camera trap is laudable. But for the use of this technique to highlight the status of tiger and help in conservation, it should be improved to obtain repetitive field evidences of the order of 500% or more than actual existence and reject all overlaps so that a more accurate minimum number of tigers is known with their field details. It should be able to discuss the figures of only non-virtual tigers, and present details about the composition of tiger population as male, female and cub in some kind of size-index classes representing different age classes. The result should highlight the spatial distribution and movement areas in relation to male-female and mother-cub dispositions with blank ranges mirroring sites of anthropogenic pressure. The usefulness of the results should not be thwarted with possibility of changes to the population because of the time taken in years to complete field work and deduce results. The entire procedure should also aim at preserving the traditional skill of forest people and involve the field staff to such an intimate level that each staff is able to identify himself with the tiger and its territory he is expected to protect or conserve. The field science should be simple and aimed for practice by field personnel who are not researchers of any standard. For effective conservation of a species like tiger the Manager should be equipped with results that have not emerged because of reduced field rigors and conveniences of

sampling experiments.

It is wished that in order to match the already-evident-utility of pugmark tracking the photo-trap technique addresses the above mentioned aspects. It may get identified as the method to move with for tiger conservation in the coming decades. Science is developing fast and it could happen sooner than we think.

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