Report on Capturing and Translocation of a Male Tiger from Dr Dushyant Sharma, Senior Veterinarian at Corbett Tiger Reserve, India

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ABSTRACT

A male tiger (that was suspected of being dangerous to human life) was captured at in the Dhikala Zone of Corbett Tiger Reserve on the 15th of November, 2019. It was suspected that the animal was responsible for the deaths of three human beings in recent months. It was also reported that the tiger was chasing vehicles and ambushing forest staff that were on patrol. The tiger was identified, tracked, chemically immobilized, captured, and after a thorough review of the facts, was translocated to the Nainital zoo.

BACKGROUND

A tiger had killed two forest personnel at Tunbhoji area and another in Khinanauli in recent months. DNA samples of the tiger were taken from the deceased and details were sent to the National Tiger Data Base for matching. The samples were matched to a male tiger in recorded in the Shivalik database with database ID 12_90. (Table-1). The identification of the animal was further confirmed by information provided by local forest staff and images from camera traps in the area. A detailed survey of the area was conducted by a team comprising the Wildlife Manager, a Wildlife Veterinarian, a representative of the NTCA, and a representative of the Chief Wildlife Warden. Upon obtaining permission from the Chief Wildlife Warden of Uttarakhand, the operation was initiated on the 10th November, 2019. The tiger was chemically immobilized and captured in the Tun Bhoji section of the Dhikala Range on the morning of the 15th of November, 2019.

Table 1.

Details of tiger match with national tiger database.

Report No.: WII/TIGER CELL/2019/016

Skin/Individual image received from Chief Wildlife Warden, Uttarakhand

Individual image received from and date: Corbett Tiger Reserve, 16-Nov 2019

Skin/Individual image

Match found in National Tiger Database[Yes/No]: Yes(Shivalikdatabase)

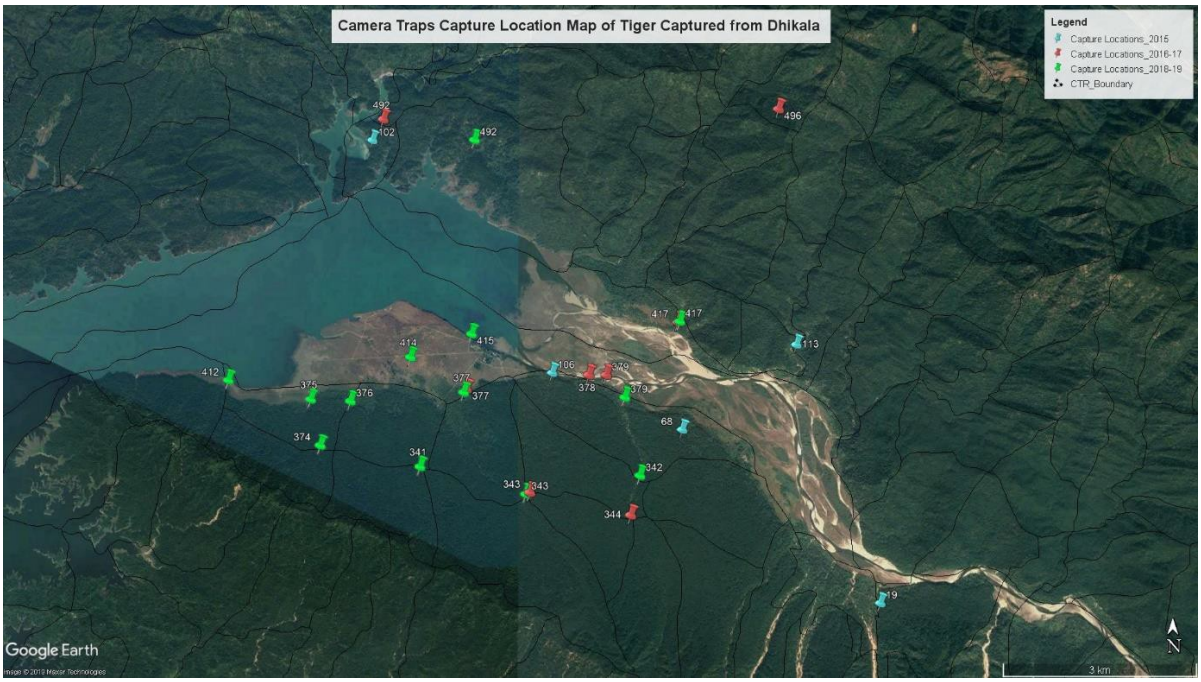
Match found with database ID

ID: Corbett 12_90

Season	70T2, 2014 and 2018
PAName	Corbett
Latitude & Longitude	Provided below
Gender	Male
Picture from Database Left Side:	
Right Side:	

LOCATION REFERENCE IN GIS/GOOGLE EARTH MAP

This individual was also photo captured at several locations in Dhikala range in camera traps deployed by both Wildlife Institute ofIndia (WII) and CTR to monitor the tiger population in 2012, 2014-15, 2016-17 and 2018-19 exercises as an individual ID Corbett12_90.



Map: Camera Trap capture locations of tiger (ID: Corbett12_90) captured at Dhikala on dated 15th Nov 2019+

CAPTURE OPERATION

To be effective, operational planning must take place in a structural way. The following four teams were constituted for this operation:

1. **The Watcher Team** – kept on eye on the tiger's movement from the watch tower.
2. **The Vehicle Team** – (Two Gypsy and one rescue truck with six forest staff) was responsible for scanning the movement of the tiger through camera traps, and eventually transport the equipment to the spot.
3. **Th Elephant Team –** four camp elephants (Gomati, Lachma, Sonakali and Pawanpari) with their mahouts and gunners were responsible for scanning the dense forest areas inaccessible to the Vehicle Team.
4. **The Ground Team** – Included 8 persons and was responsible to act and handle the tiger once it was immobilized.

A detailed examination of the factors that might affect the success or failure of the operation was taken into consideration. First and foremost, the rescue team had very clear instructions from the Chief Wildlife Warden that priority must be given to the safety of the capture team personnel. This imperative was front and center throughout the operation.

The objective of the operation was to chemically tranquilize and capture the tiger to determine its ability to survive in the wild in a manner that was non-threatening to humans. If he was fit, he was to be radio-collared and released into theforest. If not, it was to be transferred to a zoo.

The operation was initiated on the 10th of November, 2019. The rescue operation began at 6:30 am each morning. The location of the tiger was traced by elephant team in the dense vegetation and in the grassland. The Vehicle Team patrolled the roads. The watcher Team was deployed in strategically located watch towers near waterholes frequented by the subject tiger.

On day one, the Elephant Team located four tigers in the grassland near a kill. The two sub-adult tigers were frightened by the elephants and ran into and hid in heavy scrub. The adult tigers, one male and one female, also evaded further inspection by the Elephant Team. The dense vegetation prevented the team from singling out the right animal. Over the course of the next few days, the Teams were only able to locate the female and the two sub-adult tigers. Eventually, on the morning of 15th November, 2019, the rescue team located a large male tiger in a thicket near a kill. The elephant team flushed out the male tiger. After a positive identification of the subject tiger, it was darted from elephant back (Drug and dose-Table -2). A higher drug dose was employed to ensure rapid knock-down.

(Table-3)

Immobilizing Drugs and doses

Sex/Age	Primary Drug	Dose	Sedative	Dose	Antagonist	Dose
Male above 11years	Ketamine (100 mg/ml)	200 mg initial dose, followed by 100 mg i.m top-up dose at every 20 min. interval	Medetomidine 10 mg/ml	14 mg i.m	Atipamezole 20 mg/ml	42 mg i.m

(Table-4)

Observations

Weight (est)	Level of Nutrition	Stress level	Over all health	Induction period	Sedation	Antidote	Aerosal
200 kg	Good	low	Good	Less than 3 min. but the animal was approached after 20 min.	90 mins.	3x the dose of medetomidine	After10 min. of the antidote.

Handling and Care: After darting the animal, he was left alone with the team ensured that it was not disturbed by sound or related stimuli. After waiting for 20 minutes, the tiger was approached from behind by the Veterinarian and a firearm backup. The animal was prodded with the pole-snare to ensure it was completely tranquilized. A blindfold was placed to protect the tiger's eyes from direct sunlight, which could damage his retina. After observing the rate and depth of respiration, the mucous membranes were examined to measure the capillary refill time. Oxygen was supplemented. These vital signs were continuously monitored at 5 minute intervals to identify potential changes. Meanwhile, the animal was radio-collared and a top-up of ketamine was given to ensure the depth of anesthesia. Then the animal was transferred to the rescue cage and transported to Dhangari for further detailed health examination.

Post-capture Health Assessment: The tiger was re-tranquilized at Dhangari for the detailed Health Examination. This health and physiological examination was conducted by a team comprising Scientists of WII, Wildlife Veterinarians, Biologist and Forest Officers.

Summarising the significant findings of clinical examination:

- Chronic generalized periodontitis
- Yellowish discoloration of the teeth indicating the mature age of the animal.
- Some missing or carious teeth
- Marked dental attrition
- A prominent fresh wound on his nose indicated that the animal was recently involved in a fight.
- Claws of both hind paws showed signs of wear and tear.

(Table-5)

Post-induction monitoring of the vital sign during the immobilization

Time	Respiration	Heart rate	Temp.	SpO2
5 min.	9/min	76/min.	--	
10 min.	8/min.	68/min	101.8	92
15 min.	11/min.	60/min	do	85
20 min.	9/min	75/min	101.7	65

Table 6

Sign exhibited during the complete immobilization

Parameters	Signs exhibited by the tiger during the immobilization
Rectal temp.	Normal
Respiration	Deep and slow
Heart rate	Slightly high but more or less rhythmic
Palpebral reflex	No reflex
Gum	Light pink
Colour of blood	Initially light followed by dark in colour

Table 7

Parameters:

Weight	184kg
Length	75 inches
Tail length	42 inches
Height	36 inches
Chest girth	50 inches
Neck girth	29 inches.

Throughout the period of immobilization, oxygen was supplemented, and a top-up of ketamine was administered at 20-minute intervals. After 70 minutes, a reversal dose of atipamezole, a potent alpha-2 adrenergic antagonist that has been successfully used as an antagonist for Medetomidine-induced sedation, was administered. The typical dose of medetomidine is 5 times that of atipamezole. However, the Veterinarian took into account the time elapsed since administering the medetomidine and only gave the tiger 42mg of Atipamezole (3 x of medetomidine). This helped minimize potential side effects of the adrenergic antagonist.

The stages of recovery post-atipamezole were as follows:

(Table -8)

Stage of Atipamezole induction recovery	**Onset of arousal (minutes)**	**Sternal recumbency**	**Full recovery**
Atipamezol @ 3 times of the medetomidine	6 min.	10 min.	27 min.

Based on the above observations, the tiger was found to have passed his prime age and had performed its ecological role. Due to the physiological impacts of his advanced age as reflected by his compromised teeth and hind claws, it was concluded that the tiger was forced to either pursue easy prey such as humans or resort to stealing kills from other tigers. As the animal was established to be a threat to human beings, it was determined that he was unfit to be released back into the wild.

RISK/ DIFFICULTIES RELATED TO THE RESCUE OPERATION:

1. **Positive Identification**: There were four tigers, including two sub-adults, sharing the same territory. It was essential that the team identified the correct animal prior to chemically immobilizing it. This was greatly impaired by the dense vegetation of the territory.

2. **Habitat**: The dense vegetation further hampered the operation as the dart could easily have been diverted off course by grass, twigs, branches, etc. The darting range was further reduced in the bushveld area as the subject animal could easily be lost in the thick undergrowth.

3. **Approach**: Approaching the animal to within darting distance in open grassland was very difficult.

4. **Darts**: Darting from elephant back in tall grasses was not an easy task. Light, plastic darts are particularly susceptible to being blown off course by the wind.

5. **Post-immobilization monitoring**: Safely monitoring the tiger to ascertain his state of consciousness after darting was very difficult due to densevegetation.

6. **Minimizing Risk to the Team**: The team was operating in a territory shared by three other tigers. This greatly added to the risk of the ground operation. As such, the three elephants were used as a wall to protect the rescue team from potential attack from the other tigers.

7. **Logistics Post-capture**: Logistics of safely transferring the caged tiger into the rescue truck for transport were extremely challenging for two reasons:

    - The terrain prevented the team from bringing the rescue vehicle to the location of the caged tiger.

    - It was not possible for the existing team to manually move the heavy cage with the large tiger in it into the rescue truck.

    - As such, a tractor was used to tow the cage to the rescue vehicle. The cage was then safely and successfully loaded into the vehicle with use of its hydraulic lift.

FACTORS CONSIDERED BEFORE THE USE OF THE POWERFUL IMMOBILIZING DRUG:

1. **Ethical Considerations:** It is not a right, but rather a privilege to use extremely potent drugs on wild animals. Possession of a license to do so predicates and dictates that the holder of such a license use it with utmost responsibly and care. Not only must the Veterinarian follow all underlying laws and regulations, s/he is expected to behave in an ethical manner.

2. **Health of the Animal:** An assessment of overall health of an individual animal is often difficult. In this operation, we took into account the following factors in ascertaining the health of the tiger.

    - **The Season:** The level of nutrition was high towards the end of the Monsoon. This sound nutritional conditioning greatly improved the animal's ability to tolerate the immobilizing drug and minimize its potential negative side-effects.

    - **Stress:** The stress level of the tiger would have been grater if another male tiger was present in the territory. Fortunately, no other male was found to be present in the area, thus related stress levels were considered to be minimal.

    - **Age:** Young animals' systems are not well developed to metabolize and thus limit potential side-effects of the immobilizing drug. As the subject was an adult tiger, related damage to the animal was deemed to be limited.

    - **Health Assessment from Camera Trap Images:** Strategically placed camera traps provided the team with images of the subject tiger. An examination of these images suggested that the tiger was fully grown and in good health.

    - **Environment:** The ambient temperature at the time of the operation was around 16 degrees Celsius. This was favorable in terms of allowing heat loss to take place at a satisfactory rate.

    - **Time of Day:** The Teams worked to track the tiger throughout the day. However, unanticipated delays are inevitable in the forest where all factors cannot be effectively controlled. If the darting operation were conducted in the latter part of the day, delays could result in the operation extending into periods of darkness, which would render the operation unsafe for both the Rescue Team as well as the tiger. As such, it was decided that the chemical immobilization would only be conducted in the first half of the day.

- **Night Capture Attempts:** The Team installed a cage trap near a carefully selected waterhole. The simple release mechanism is triggered when the animal attempts to take the bait that is attached to the cage. This was installed in an attempt to safely capture the animal at night.

Cage Trap

JUSTIFICATION FOR KEEPING THE TIGER IN CAPTIVITY

After carefully examining the tiger, the Team concluded that it could not be released back into the wild and recommended that it be translocated to the Nainital Zoo. This recommendation was issued in the best interest of both the tiger as well as humans in the area. On average a tiger can successfully hunt its natural prey in the wild until the age about of 8 years. Thereafter, the animal's physiology starts to show signs of its maturing age as reflected in damage to essential teeth and dulling of its claws. The loss of these essential weapons greatly hampers the tiger's ability to hunt its natural prey. As a last resort, the animal turns to easier prey, including human beings. The subject tiger was over 11 years old. They close physical examination of the animal showed that he has lost some of his critical teeth and that the claws on his rear paws were dulled by age. The tiger would either starve to death or resort to continually hunting human beings in his territory, which included both forest staff as well as tourists that had started visiting the zone on the 15th of November, which coincided with the day of the tiger's capture. The team concluded that it was in the best interest of both the animal as well as human beings in the area to translocate the tiger to the Nainital Zoo.

CONCLUSION: A successful chemical immobilization, capture, and translocation operation is predicated upon the following:

1. **The Team**: One of the foremost components of a safe and effective capture and translocation of a tiger is the team involved in the operation. This has proven to be the case in the Dhikala Operation. The surveillance conducted by the team of forest staff in Dhikala was impeccable. This included:
    a) The foot patrol team, which clearly had an in-depth knowledge of the behaviour of this tiger and the terrain.
    b) The Elephant Team – the incredibly dense undergrowth made it virtually impossible to safely penetrate the dense forest and grasslands that encompassed the territory of the tiger. The mahouths demonstrated the mastery of their control over their elephants; great knowledge not just of the subject tiger and his behaviour, but also that of the other three tigers in the area; and their familiarity with the terrain of operation. The safe and successful execution of the operation would have been greatly compromised had it not been for their presence in the Team.

2. **Intimate Knowledge of the Target Species**: It is essential that the team leader be extremely well versed with the behavior of the target species. S/he must be able to predict its behavior prior to immobilization, its optimal physical state while under the anesthetic, and its recovery after sedation. The examining team must be able to correctly ascertain the level of risk posed by the animal

3. **Comprehensive & Competent Examination of the Animal under Sedation:** The decision of release or translocate has a very thin, if not non- existing margin of error, as it directly impacts the safety of the animal as well as that of human beings in the area. As such, it is essential that the team examining the animal must be amongst the best in their field.

4. **Impeccable knowledge of the Terrain and Prevailing Environmental Conditions**: The Team Leader must be aware of the existing climatic conditions, the terrain, etc. and their possible impact on the success of the operation. For instance, in this case, the cool temperatures had a positive impact on the operation; while the dense, post-monsoon undergrowth hampered it. The Team Leader took all of these and numerous other factors into account in formulating the plan and executing the operation.

5. **Ability to Successfully Identify Related Risks and Develop Strategies to Mitigate them**: Every chemical immobilization operation is unique and presents its own unique sets of risks. It is essential that the Team Leader formulate and execute the plan by carefully studying the overarching context of the operation. The plan must consider all of the above-mentioned factors.