Formulating a working protocol for rescue and translocation of Greater One horned rhinoceros based on experiences of three cases in India

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Abstract: Straying of Greater one horned rhinoceros from protected areas to fringe villages is observed mainly because of increased biotic pressure on protected habitats. In some protected areas like Pobitara wildlife sanctuary in Assam, some of the rhinos are observed to be habituated to crop raiding where biotic pressure is very high. Strayed animals sometime get disorientated in thick human population around the protected areas. Such disoriented animal becomes a soft target for poachers. Traditionally disoriented animals are tried to retrieve back to protected areas with the help of manpower and trained captive elephants in Assam. Such effort consumes lot of resources as well as time. When such an effort fails, chemical restraining and translocation of the disoriented animal becomes the only viable option left to save the life of the individual. Chemical restraining in a thick human habitation is a challenge for the field veterinarians. However, considering the conservation status of the animal, public sentiments involved with the species and to save the life of the individual from chances of being poached; the veterinarians has to take up the challenge. Three such unusual cases are reported here where no fixed protocol for immobilization and translocation could be followed. But in all three circumstances a feasible working protocol was formulated and executed successfully on the field. The immobilization operation carried out after 15 days to 90 days of straying out of the animal and moved all along in thick human population. Out of three animals that were captured and translocated, two animals survived. One of the animals died after 12 hours of intervention due to stress factors, the second animal released in Manas National Park and the third one transported to a captive facility. Both the survived animals are in good health till date. Based on the experiences gained from three cases of immobilization and translocation of Greater one-horned rhinoceros a working protocol is presented for attending such cases.

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Introduction:

Traditionally strayed out rhinos are retrieved back to the protected areas with the help of captive elephants and manpower but such efforts, although successful; consume lot of resources and time (Talukdar, B; personnel communication). Such strayed rhinos also predispose itself to being poached as they become a soft target in thick human habitation areas.

Three Greater one-horned Rhinoceros were safely captured from thick human habitation and translocated back to either captivity or protected areas.

Materials and methods:

The lesson learnt from all the three cases were combined together to formulate a working protocol for approaching and handling such cases.

Case1

On 12th December 2006, an adult male rhino weighing about 1800 kilogram strayed out of the Eastern range of Kaziranga National Park, Assam. It was immediately tried to retrieve back to the National Park with manpower and captive elephants. The curious villagers also joined the forest personnel in driving the animal back but it created the unwanted confusion in the animal and it started running towards the north-eastern direction. The effort of bringing back the rhino in similar manner continued till 23rd February 2007. The animal traveled about 300 Km from the park boundary and cross the river Brahmaputra and reached Lakhimpur district (fig1 map). On 24th Feb 2007 the Forest Department contacted the authors for exploring possibility of chemical immobilization and translocation of the animal.

The animal was examined on 24th February 2007 when it was found in a dry riverbed (*char*) area. The body condition of the animal was found to be poor and under stress. Feeding, defecation and urination of the animal observed to be near normal. The animal was surrounded with heavy vehicles like trucks early morning to restrict its movement in the dry area. Two captive elephants were also available for the job but all of them had no exposure to rhino and hence were quite apprehensive of approaching. The

rhino was approached for darting with the help of a JCB for the reason as explained above. The animal was injected with 1.8 ml Immobilon L.A. (Vericore Ltd, Mere Park, Marlo) and down time recorded to be 04 minutes. The darting, sled and crating took 45 minutes. After crating; the animal was injected with 2.6 ml of Revivon (Vericore Ltd, Mere Park, Marlo) and was on its feet within 07 minutes. Transportation of the animal started soon after and the entire journey from Lakhimpur to Kaziranga National Park took 07 hours. During the journey the animal was examined periodically and found to be alert and sitting on its sternum most of the time. The animal gets up only when the vehicle stops. After reaching the destination at Kaziranga National Park the animal was examined at 3 am and found to be struggling with frequently getting up and down, kicking the crate door with hind legs and died immediately on sternal recumbency.

Post mortem examination conducted after two hours of death and gross lesions observed were as follows

- The incisors and molars were examined for estimating the approximate age of the animal and found the animal to be nearing senility.
- Heavy cestode infestation in stomach and small intestinal attributed to stress factors.
- Chicken jelly clot in the right ventricles seen.
- Numerous lead splinters were recovered from the sub-cutaneous tissue of the animal. The splinters were probably fired from a low velocity firearm when the animal was in human habitation as a retaliatory measure.

Case: 2.

A sub adult male rhino of about six years of age was chemically immobilized and translocated to Kanpur zoo which have probably strayed from the neighboring country Nepal to India via the Lagga Bagga area of the state of Uttar Pradesh. After nearly 03 months of straying into human habitations and traveling for about three hundred kilometers; the animal was finally immobilized and captured close to Muradabad town of Uttar Pradesh of India in January 2005. The animal was escorted right from the International boundary to the site of capture by a team of Forest Officials and Veterinarian experts from Lakhnow Zoo in the state of Uttar Pradesh for nearly three

months to find a suitable location to restrain its movement and safely immobilize (*Forest department, Uttar Pradesh Personnel communication 2005*).

From the month of January-February; the sugarcane cultivators of Northern India normally start harvesting their annual crops during January-February. During this period the strayed rhino took shelter in sugarcane field because it gave the much needed hide from disturbances and the fodder it requires in the form of barseem and mustard cultivations nearby. It normally takes shelter during the early morning period in a thick sugarcane field and spends the day there affecting the harvest of the farmers and also damaging crops. The animal used to move late night or early morning hours when the disturbance factors are minimum.

Under such scenario the animal had to be immobilized in a sugarcane field. For that the movement of the animal had to be restrained in a particular field till the logistics required are put in place. The overnight movement of the rhino from a specific sugarcane field was tried to be restricted with the help of manpower. Local hired labors were placed surrounding the sugarcane field on the periphery at a distance of 5-6 meters all throughout the night and early morning. Available vehicles were parked surrounding the field to give additional effort for restricting the movement. Fire was also put on at different locations in the periphery of the field to add to the disturbance factor to restrict the movement of the animal till the logistics were placed in a suitable area close to the field. The total area of the field was close to a square kilometer. The dart was prepared after assessing the size of the animal from photographs taken earlier. The rhino was approached with the help of two captive elephants for darting. The visibility inside the field was relatively less but an open area inside the field where the crop was damaged by pests was found when surveyed on elephant back. That area was selected as the most suitable for darting and accordingly one of the captive elephant was used to drive the animal towards the open area while the sniper on the second captive elephant was waiting close to the open area. During survey or driving noise and disturbances were kept to a minimum so that the animal does not get too confused and starts running away from the field. The exercise of driving the animal close to the open area for darting lasted for nearly two hours. Finally one opportunity was provided by the rhino and the animal was darted successfully. The dart consisted of 03 ml of Large animal Immobilon (Immobilon

LA,). The animal was left undisturbed after darting and only closely monitored from the elephant back. The down time recorded was four minutes. The sledging and crating took about 01 hour 15 minutes. The anesthesia was reversed with 6 ml of Revivon. The animal was transported to Kanpur zoo and the journey took about 10 hours. No adverse clinical sign of capture and transportation was evident in the animal post release.

Case 3

Under the Indian Rhino Vision 2020 in the state of Assam, two males, an adult and a sub-adult male were translocatd from Pobitara wildlife sanctuary on 11th April 2008 and were released in Manas National Park on 12th April 2008. The sub-adult male animal was noticed to habituate to crop raiding and every evening it strayed into adjoining villages to raid crops. During the retaliatory chasing on 1st September the animal might have got confused and got disoriented inside the thick human population. Effort to drive the animal back into the protected area with manpower and captive elephants failed for next three days and decision to immobilize and translocate was explored.

A list of all the logistics required is prepared in consultation with a core team for immobilization. The logistics and core immobilization team was moving along with the rhino from the day of straying till it was captured successfully. The retreating monsoon season was the biggest challenge for immobilization of the animal as most of the areas occupied by the rhino were full of water bodies. From 4th September till 13th September the animal was moving in mostly areas covered by large water-bodies. On 14th September the animal was located in a dry riverbed (map 2). Surveying the area from a safe distance with the help of captive elephant reveals an area of about 200 square meter of the riverbed is devoid of any water-body and conducive for immobilization. A 3 ml metallic dart of Dist-inject$^{@}$ 60N rifle was prepared with 02 ml of Immobilon L.A. The animal was approached with seven captive elephants and was driven towards the dry area for safe darting. The animal was approached in a semi-circle manner encouraging it to move towards the dry area while the sniper on a different captive elephant was waiting at the edge of the dry area and gradually approaching towards the animal. When the animal was about mid-way in the dry area it was darted from a distance of about 25 meters. The complete down time was 05 minutes. Sledging and crating took about 1: 10 hrs. After

crating the animal was injected with 04 ml of Revivon and complete recovery time recorded to be 05 minutes. The transportation to the destination was 08 hours with 05 stoppages en-route. The animal was released back in a power fenced area inside Manas National Park. The animal is being monitored and no abnormality noticed post capture and translocation till January 2009.

Discussion:

The protocol proposed by us is as follows:

- Decision of intervention: weighing the circumstances to stress factors of the animal; sooner the intervention the better.
- Study the topography of the area of operation approximately about 5 square kilometers around the animal to find out the comparative suitability of the areas for intervention.
- Contacting police and army personnel for crowd management according to the need of the situation.
- Resource list preparation with available resources at that moment locally.
- Resource mobilization beyond 50 km distance is ruled out and regarded as unavailable under circumstances when the animal is in a suitable location for immobilization and restricting the animal's movement is not feasible.
- Decision on critical requirements: Captive elephants with previous exposure of Rhinos. If unavailable JCB, excavators, tractors need to be explored for restricting the movement of the animal before immobilization and approaching the animal for immobilization and
- Creating a multidisciplinary team comprising forest officials, veterinarians, veterinary assistants, skilled labors, police and paramilitary force personnel, drivers of logistics like truck tractor and/or JCB, Mahouts, captive elephants, and Cook and food suppliers.
- A core team of at least two senior forest officials, all veterinarians, senior police official, Drivers, Mahouts and selected skilled labors created.

- The team members discuss in brief about the procedure to be followed. Any queries from any member are welcome considering no idea is a non-sense idea.
- Final approval of the working protocol.
- Optimum utilization of resources ensured through distribution of responsibilities
- Once decided for intervention: stopping any further attempt of unnecessary chasing/disturbing the animal provided it is in a comparatively suitable area for immobilization.
- Normally such disoriented animal take shelter in a hide and move late night or early morning hours when the disturbance factors are minimum from anthropogenic causes. Hence effort of confinement for immobilization purposes needs maximum attention during that period.
- A no man zone of minimum of about 500 meters created around the animal at least 12 hours before the start of the operation for immobilization.
- Approaching the animal for immobilization considering the safety of the animal and the handlers in captive elephants/vehicles like JCB etc depending upon the availability of resources.
- Driving the animal to short distance to bring it to a suitable dry area without water bodies, trenches etc by means of captive elephant. In absence of enough captive elephants or if captive elephants are apprehensive of approaching the charging rhino, vehicles like trucks and JCB's are found to be successful.
- Darting by approaching on captive elephant, JCB, excavators.
- Restraining the movement of the animal post darting for minimizing the flight distance with the help of captive elephant, manpower, and innate objects like vehicles thus preventing of losing sight of the darted animal and facilitating sled and crating.
- Sledging
- Crating
- Transportation
- Release in wild or captivity
- Post release monitoring at lease for a period of 03 months for signs of capture related complicacies.

Conclusion:

- **Identifying the reasons of straying of animal and remedial measures need to be taken.**
- **Cost-benefit analysis of such rescue and translocation cases need to evaluated for justifying the intervention.**
- **Immobilization drugs, immobilization kits and accessories, logistics should be kept at hand in all protected areas for timely intervention of such cases. It is seen that mobilization of resources unnecessarily takes time and money when they are unavailable at hand.**
- **A core group of experienced wildlife veterinarians should be formed for attending such cases on emergency basis. Amateur veterinarians also need to take part under such cases and can help in forming a larger group of human resource available for attending such cases in future.**

Annexure 1:

1. 1. Map of stray route of the case 1. The animal strayed from Kaziranga National park (source) to Kakoi Reserve Forest area. The Kakoi reserve forest area is the site of capture.

2: Map showing the stray route of Rhino 03 case. Rhino 12 location is the site of capture and Rhino 0 is the origin in situ

Maps to be added later