

THE  
RELEASED RHINOS  
IN MANAS NATIONAL PARK  
- THE FOURTH YEAR  
[APRIL 2011 - MARCH 2012]



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INDIAN RHINO VISION (IRV) 2020 PROGRAM



## Introduction :

Indian Rhino Vision (IRV) 2020 a program for the long term conservation of the one horned rhinoceros in Assam is developed and implemented by the Forest Department, Government of Assam with the support of WWF and IRF. The program aims to increase rhino population in new / potential habitats all throughout the state of Assam by the year 2020 and is supported by a number of organizations including the USFWS. The BTC also extends its support to the program. As a first step, the training-cum-translocation was completed in April 2008 wherein two male rhinos captured in Pobitora WLS were translocated and released in Manas NP and



Plate1- Monitoring along river Beki

thereafter sixteen more rhinos have been translocated to Manas NP to reach a total population of eighteen rhinos through wild to wild translocations from Pobitora WLS and Kaziranga NP. Of the total, 10 rhinos were translocated from Pobitora WLS and the rest from Kaziranga NP. The plan for the first phase of translocation was to translocate a total of 20 rhinos, 10 from each of the source PA's of which two remains to be translocated from Kaziranga NP. All the rhinos except one are fitted with radio collars and are tracked on a regular basis since the time of their release in the park. The rhinos translocated have been ear notched for easy physical identification to aid regular monitoring. The present account is for the period from 1<sup>st</sup> April 2011 to 31<sup>st</sup> March 2012. The rhinos are fitted with VHF collar and tracking has been done primarily based on radio telemetry using six sets of antennae and receiver systems, in addition physical sign based monitoring is also undertaken and in special cases camera traps have also been employed.

The monitoring team in Manas monitors the rhinos under the experienced leadership of FDTP Manas, Mr. A. Swargowari with technical support from the WWF team. The activities are conducted under the guidance and supervision of the Translocation Core Committee (TCC).

## Release of rhinos in Manas NP :

During the current period of reporting ten rhinos (two males and eight females) have been released in the park in three batches. The first batch was from Pobitora WLS that consisted of two females and was released on 9<sup>th</sup> January, 2012 and this completed the quota of 10 rhinos from Pobitora as per the plan. The second batch of two females and their calves was from Kaziranga NP and was released in Manas on 20<sup>th</sup> Feb 2012. The next batch was also from Kaziranga and was released in Manas on 12<sup>th</sup> March 2012. This batch consisted of two females and their two male calves. All the rhinos during the first twenty-four hours were observed closely and it can be stated that all of them in comparison to the earlier released rhinos seemed to be calm and stable as they were found to be exploring areas within a distance of about 2 to 3

kilometers after release. All the rhinos during the first twenty four hours of their release were found to be ranging in the areas close to Buraburijhar, Kuribeel and Rhino camp and also visited the release site. The stable character demonstrated may be due to the feeling of the presence of other rhinos in the area and also as they may still be having the after-effects of sedatives.



Plate2- Rhino9 walks off during release



Plate3- Rhino10 at the time of release in Manas



Plate4- Rhino11 & 12 at the time of release



Plate5- Rhino13 & 14 walks off in Manas



Plate6- Rhino15 & 16 getting released at MNP



Plate7- Rhino17 & 18 at the time of release



## Habitat use and Ranging:

During this period, collars on five of the rhinos stopped functioning and eleven rhinos had functional collars. Of the five non-functional collars, three were found to have dropped and two are still on the rhinos and could not be opened as the rhinos could not be tranquilized even after making attempts. Of the three drop cases two were on sub-adult males and the third on a female, it is believed that the male Rhino2 bit off the collar on Rhino6 during a courtship on 7<sup>th</sup> August 2012. The other two collar drops have resulted probably due to fights when the collar belt was chewed-off. The rhinos without collars were physically monitored following signs and identified on the basis their ear notch. During this period, the collar that was fitted on Rhino1 and 2 in April 2008 was taken off. The team was successful in carrying out the tranquilizing and collar removal/ change operation under very challenging field conditions. The collar on Rhino1 was opened on 21<sup>st</sup> June 2011 as the collar was observed to have tightened around the neck. The collar on Rhino2 was replaced on 24<sup>th</sup> April 2011 after it stopped working and the new collar is presently working. In case of difficulty in observing the rhinos, camera traps have also been used for documenting the rhinos. About 120 camera trap nights were used in all the ranges and this procedure was mainly used to monitor the rhino occupying the Panbari range. During this period, a total of about 3960 efforts were made to locate the rhinos and of these physically the rhinos could be observed for 1508 times (~38%) usually trying to home-in on elephants. It was a very difficult exercise to locate the rhinos without functional collars as they are spread all over the park and as the habitat offers very limited opportunity to locate an individual.

The last batch of rhinos to Manas comprised of Rhinos 15 to 18 all from Kaziranga NP and was released in the park on 12<sup>th</sup> March 2012. These 18 days of post-release in Manas were quite eventful and initially all the four rhinos demonstrated a normal behavior and showed characters of adapting to the new habitats. The rhinos were released in the Buraburijhar area of the park and were seen to be exploring areas within a radius of about 3kms. from the site of release. Rhino15 and its calf 16 was seen using the Buraburijhar, Charpuli, Kuribeel and Latajhar area till the calf decided to move east towards Bhuyapara in the last part of the month. Rhino17 and its calf 18 were also seen to be using the Buraburijhar, Charpuli and Latajhar area. These two rhinos were seen to be exploring areas to the west and on 26<sup>th</sup> of the month they were detected to have reached the Songlapani area near Kahitema after crossing the river Beki. The two rhinos strayed out of the park on 27<sup>th</sup> of the month through the Kahitema area, this has probably resulted as the area often experiences disturbance from illegal human activities. Both the rhinos strayed out together but soon got separated due to large human disturbances in the densely populated village areas. Rhino18 the calf was guided back to the park through the Kahitema area the same day evening but Rhino17 moved east and entered highly populated areas creating a lot of chaos. The rhino was ultimately guided back to the park the next day with a lot of effort through the Katajhar area after traversing a distance of about 25kms. The two rhinos got separated and seemed a bit tense and were searching for each other. As a bit of the effort

to unite the mother Rhino17 slowly moved west within the park in search of its calf however Rhino18 again strayed out of the park tentatively following the earlier route on 31<sup>st</sup> March 2012. The rhino was again pushed back to the park the same day evening with the help of four departmental elephants through the Kahitema area. Among all the rhinos translocated this was the only case of a major stray recorded immediately after release.

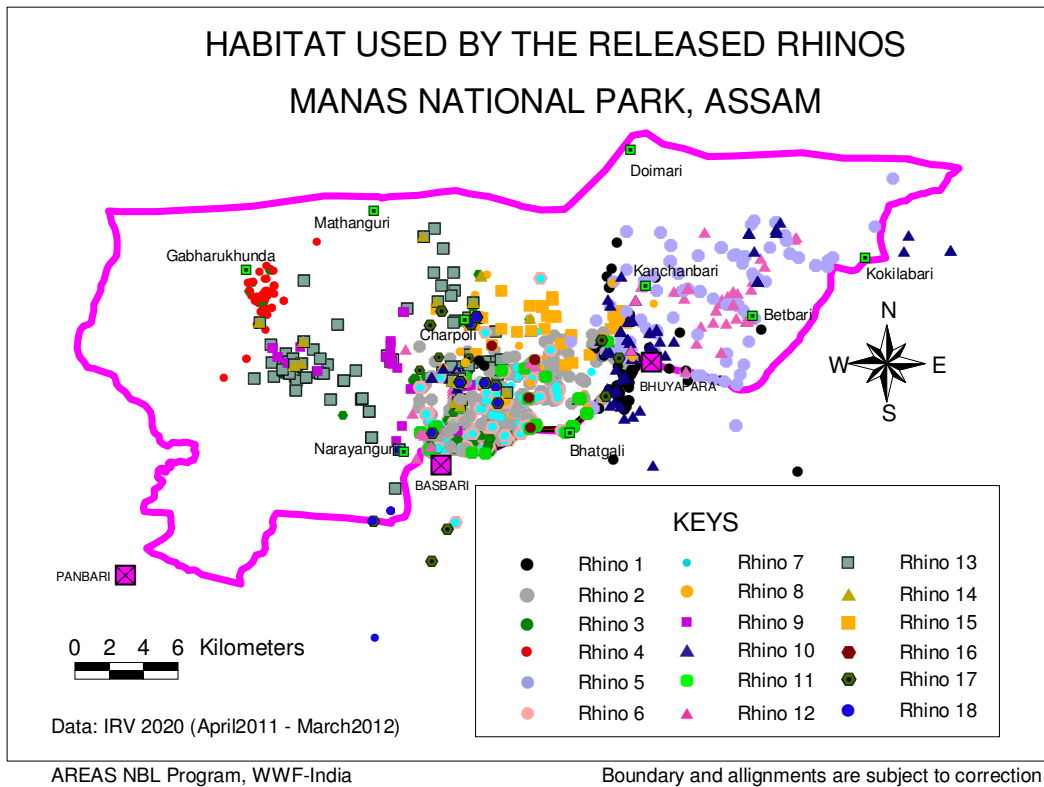


Fig.1 – Map showing location of rhinos recorded during the period April11 to March, 2012

Manas received the first batch of rhinos from Kaziranga NP on 20<sup>th</sup> Feb.2012 when Rhino 11, 12, 13 and 14 was released in the Buraburijhar area of the park under Basbari. It has been about 40 days for these rhinos in the park and they seem to have been adapting well to the new habitats. Rhino11 is the calf of Rhino 12 and both of them were released together however they got separated post release and were observed to be united only after two days. Thereafter both the rhinos are seen together and preferred to range in the Buraburijhar, Kuribeel, Langpati and Kanchanbari area under Basbari range during February. In March they started to move east, stayed separate at times and were observed to be using the swampy areas near Bhatgali and thereafter they moved further east to range in the Dhanbeel, Digjhari, Betbari, Agrang and Kanchanbari under Bhuyapara range. Rhino12 was seen to be using the mentioned areas along with Rhino8 and Rhino10. During this month, Rhino11 got a bit injured when the Rhino2 tried to mate with her near Bhatgali.



Rhino13 and 14 were observed to have united after release the same day afternoon. During February, both the rhinos stayed together and mainly used the habitats near Buraburijhar, Kuribeel and Rhino camp they gradually moved north and during the first part of March both of them were seen using the areas near Charpoli. During the later part of the month, both the rhinos moved west to cross the river Beki and from 20<sup>th</sup> March 2012 both of them were observed to be occupying the Sidajhar and Kapurpura area in-between the rivers Beki and Manas flowing through the central part of the park in a north-south direction. These two rhinos moved west suddenly because the male Rhino2 was seen to attack the male calf Rhino14 on 20<sup>th</sup> March 2012 and in the process bit off the radio collar in the grasslands near Charpoli camp.

Two female rhinos from Pobitora 9 & 10 were released in Manas on 9<sup>th</sup> Jan., 2012 and since the release Rhino9 was very stable and relaxed but Rhino10 was a bit aggressive and exploratory in nature. Rhino9 was seen to be using areas in association with Rhino6 & 7 as well as with the rehabilitated rhinos Ganga and Jamuna and spent most of the time in the Buraburijhar, Kuribeel and Rhino camp area for about 15 days. On 22<sup>nd</sup> January 2012, she was approached and chased by the male Rhino2 and this probably disturbed her and she moved west by crossing the Beki river and started occupying the Narayanguri area. She was guided back to the central part of the park but she was again chased by Rhino2 forcing her to move in different directions. Again in the first week of February, she was chased and she moved west to occupy the Bhauraguri area and also moved further north close to Mathanguri through the river tracts. This rhino continued to avoid the central parts of Basbari and rather moved further west to enter Panbari range and occupy areas close to Gabharukhunda. This rhino continue to use the same area in between the rivers Beki and Manas for most of the time till the end of March.

For a major part of the reporting period (April11 to January12), eight rhinos released through wild to wild translocations in the park during 2008 to 2011 were monitored regularly. These eight rhinos have spent a substantial time (more than one year) in the park and seem to have adapted to the conditions of the new habitat as they pre-dominantly demonstrated a stable and normal behavior.

During the month of April,2011 most of the rhinos (2, 3, 6, 7 & 8) preferred to use the short and open grassland areas of Kuribeel, Katajhar, Buraburijhar and Forte camp of Basbari range. The Rhino5 was using the tall and swamp areas of Thangunmara, Kalpani, Panda and Kokilabari areas in the central parts of Bhuyapara. Rhino1 was found to use areas close to the southern boundary of Bhuyapara specially in the Dhanbeel, Kaljhar, Digjari and Betbari areas. The Rhino4 was the lone one occupying the northern parts of Panbari range and preferably used the areas near Gabharukhunda. A similar trend was demonstrated by most of the rhinos in the months of May as well with some small change with respect to a couple of them. The Rhino3 preferred to use only the southern areas of Basbari, used the small pits for wallowing and preferred the short grass sections. Rhino5 continued using the same areas but as a change strayed out towards the north east close to the Kokilabari seed farm on a couple of occasions. Rhino8 was observed to be a bit unstable during the month and it was observed that she hardly



spent time in one location for more than 2 to 3 days. The marked change was demonstrated by Rhino1, who temporarily moved west from Bhuyapara towards Basbari after a long gap of about seven months and was observed in the Kuribeel and Forte camp area. Rhino1 also demonstrated a behavior to stray out to the adjoining agriculture fields near Betbari over a short distance from the park boundary. The rhinos ranging in June were almost similar to what was observed during the previous month of May. The straying of Rhino1 became more frequent as it got attracted to the paddy seedlings that were cultivated very close to the south boundary of the park. Rains affected the park extensively in the month of July and it was noticed that the rhinos during this month preferred to use the areas with short grassland and small water bodies. It was very difficult to effectively observe the rhino occupying the northern parts of Gabharukhunda due to accessibility issues and not much information regarding the ranging of the individual could be obtained. The monitoring activities got affected due to incessant rains and during August and the team found it very difficult to carry out the regular activities effectively. During August, Rhino1 was observed to be primarily using Rupahi, Kaljhar, Narayanguri and the short and open grassland areas near Bhuyapara range office. The Rhino2 that dominantly used the Kuribeel and Rhino camp area changed its ranging from the mid part of the month and moved south to occupy areas around 2<sup>nd</sup> Gate, Langpati and Kahibari. Rhino3 was primarily using the Pahu field area and also at times visited areas near Madrijhar, Palsiguri, Kahibari, Rhino camp, Kuribeel, Langpati and Boat camp. Very limited information was available on Rhino4 however it could be confirmed mainly based on signs that it continued to use the Gabharukhunda area. Rhino5 was primarily observed to be using the Thangunmara, Kalpani, Betbari, Panda, Kanchanbari, and Makhibaha areas of Bhuyanpara Range. Rhino6 and 7 was mainly using the short and open grassland areas of Kuribeel. The information available on Rhino8 was also limited and was observed near Kuribeel, Buraburijhar and Bhatghali. In September some visible change was observed in the ranging pattern of the rhinos, in the second week of the month it was observed that all the rhinos except Rhino4 came converging towards the central parts of the park under Basbari range for about 2 to 3 days and then again moved out. Rhino4 in Panbari was observed to have expanded its ranging a bit and was observed in the grasslands of Borbala area close to Gabharukhunda. Rhino5 after about a gap of five months was observed to have entered the central parts of Basbari (near Forte and Kuribeel) by the end of the first week, associated with the other rhinos there and remained so for the whole month.

The rains gradually ceased and with the onset of the dry season the rhinos illustrated some changes as well during October. A few water bodies that were previously commonly used by the rhinos were slowly drying up and this forced the rhinos to change their ranging a bit. Rhino2, 3, 6 and 7 were observed to be using the 2<sup>nd</sup> Gate, Kahibari, Palsiguri, Kuribeel, Tinmile and Charpuli areas. Rhino5 was primarily using Betbari, Thangunmara, Panda, Dhanbeel and Kanchanbari areas of Bhuyapara range and Rhino4 continued to use the grass land areas of Gabarukhunda and at times near Lafasari. The last observation of Rhino1 was made on the 8<sup>th</sup> of the month and on the 14<sup>th</sup> of the month the remains of a carcass was detected in the Sikagonda area close to Kaljhar camp under Bhuyapara and till date Rhino1 remains untraced confirming its death / poaching.



The onset of dry period was clearly marked in November, the grassland burning was initiated as a part of the management process and the rhinos were seen to be moving to safe and suitable areas. It was observed that the collars on Rhino3, 5 & 8 was not properly working and so it was very difficult to monitor them regularly in the thick vegetation. Rhino2 along with Rhino 6 & 7 was observed to be using Kuribeel, 2<sup>nd</sup> Gate, Bhatgali, Kahibari and Tinmile. Rhino2 was also observed to be using the areas along the east bank of river Beki. Rhino4 was observed to use the grasslands of Borbala and the along the bank of the Galeng River near Gabharukunda Rhino5 was using Gandabeel, Betbari, Dhanbeel and Rupahi areas of Bhuyapara range. Rhino3 was missing for a long period and a special search operation was undertaken in all the three ranges of the park and the rhino could be located after twenty seven days of continuous effort.

With the progress of dry period extending up to the end of this reporting period, the ranging of the rhinos became quite defined and the rhinos were seen to prefer to stay close to available water-bodies. Burning of grasslands also played a role and it was observed that the rhinos avoided the heat during the burning but at times comes to the burnt area when the temperature goes down to feed on some of the ashes and tender shoots. The rhinos were attracted to the burnt grasslands when new tender shoots and leaves re-appeared. The collar on Rhino5 stopped functioning from 3<sup>rd</sup> December 2012 onwards and the team was unable to locate the rhino for a long period and special drives were taken to locate the rhino after 24 days of rigorous search. A few apparent clusters were observed in the ranging pattern of the rhinos in the park viz. – from the south boundary under Basbari between 2<sup>nd</sup> Gate and Kahibari to Charpuli to the north bounded by river Beki in the west to around Fort; next around Rupahi-Bhuyapara-Digjhari; another in the Panda-Makhibaha-Betbari; one near Gabharukhuna and the last in between the rivers Beki and Manas extending from Kahitema-Narayanguri to Kapurpura.

During this period, a number of non working radio collars were identified and multiple attempts were made to tranquilize the individual and open or change the collars, however the terrain conditions were very tough and out of about 10 attempts made only 2 were successful. In one such occasion the radio collar on Rhino1 was removed on 21<sup>st</sup> June 2011 as the collar was observed to have tightened around the neck. In the second occasion, the radio collar on Rhino2 was replaced on 24<sup>th</sup> April 2012. A special team was entrusted this job led by veterinarians from College of Veterinary Sciences, Khanapara and all could realize that it was one of the toughest task to tranquilize a rhino in Manas due to the field conditions.

During this period, it was observed that considering all the rhinos ranging in the park, they explored an area of about 400sq.kms within the park boundary and considering the entire ranging information including stray the rhinos covered an area of about 700 sq.kms calculated using MCP in ArcView GIS. Among the newly released, Rhino12 & 13 explored a large part of the park and together covered all the three ranges with individual home ranges of about 140sq.kms. Rhino3 and Rhino5 both released earlier also explored a large part of the park and Rhino5 even strayed out in a limited way. Rhino1 & 17 also has a large range but this can be



related to the straying. The smallest home range has been demonstrated by the young female Rhino4 occupying the northern parts of Panbari range. Considering the entire ranging of the rhinos the individual pattern of the rhinos are as in the table below –

Sl.No.	Details	Area (Sq. kms.)	Remarks (Apr11-Mar12)
1	Rhino1	188	MCP irrespective of park boundary
2	Rhino2	74	MCP irrespective of park boundary
3	Rhino3	133	MCP irrespective of park boundary
4	Rhino4	13	MCP irrespective of park boundary
5	Rhino5	174	MCP irrespective of park boundary
6	Rhino6	72	MCP irrespective of park boundary
7	Rhino7	81	MCP irrespective of park boundary
8	Rhino8	116	MCP irrespective of park boundary
9	Rhino9	53	MCP irrespective of park boundary
10	Rhino10	214	MCP irrespective of park boundary
11	Rhino11	42	MCP irrespective of park boundary
12	Rhino12	146	MCP irrespective of park boundary
13	Rhino13	138	MCP irrespective of park boundary
14	Rhino14	94	MCP irrespective of park boundary
15	Rhino15	45	MCP irrespective of park boundary
16	Rhino16	17	MCP irrespective of park boundary
17	Rhino17	150	MCP irrespective of park boundary
18	Rhino18	53	MCP irrespective of park boundary

Table1 : Home range of the individual rhinos



Plate8- Rhino1 near Rupahi



Plate9- Rhino2 during radio collar change operation



Plate10- Rhino4 near Mathanguri



Plate11- Rhino9 near Gabharukhunda



Plate12- Rhino5 near Digjhari



Plate13- Rhino10 at Sikagonda river



Plate14 – Rhino13 & 14 at Sidajhar area



Plate15- Rhino17 & 18 near Songlapani



## Stray and Stray Management :

During this period two distinct pattern of rhino straying was observed, one by the rhinos released in the park earlier straying out for crop raiding and the other by the newly released rhinos post-release as a part of their exploration and adaptation to the new habitat. The stray took place only along the stretches which was not protected by electric fencing. Of the earlier released group, Rhino1 was most prone to stray and Rhino5 also demonstrated a very limited trend. Among the new batch, Rhino10, 17 & 18 strayed out of the park soon after getting release probably as they were trying to explore the new area. Rhino10 strayed over to small distances of about 1 to 2 kms close to Kaljhar and Kokilabari and returned back. Rhino17 and 18 strayed out along the Beki river through the Kahitema area and strayed over a larger distance as they had to experience a large human pressure leading to a lot of problems and chaos. This was the first experience of a post release stray in Manas.

Sl No	Month	Total nos. of attempt made	Successful strays	Stray Location(s)
1	April	7	4	Katajhar, Bamunkhal, Madangaon, Gwathaibari, Daoraibari
2	May	18	11	Katajhar, Bamunkhal, Madangaon, Gwathaibari, Kokilabari, Digjhari, Amalugori, Daoraibari
3	June	20	9	Madanguri, Gwathaibari, Bamunkhal and Bhuyapara
4	July	28	18	Madanguri, Gwathaibari, Bamunkhal, Koroibari and Bhuyapara
5	August	17	12	Madanguri, Gwathaibari, Koroibari, Deolpari, Bamunkhal, Bhuyapara
6	Sept.	7	4	Madanguri, Daoraibari,
7	Oct.	3	1	Bamunkhal
8	Jan.	8	6	Kaljhar, Bhuyapara, Agrang, Betbari
9	Feb.	15	8	Katajhar, Bhuyapara, Digjhari, Kokilabari, Narayanguri Kahitema
10	March	16	12	Katajhar, Bhuyapara, Digjhari, Kokilabari, Narayanguri Kahitema

Table2 : Monthly stray pattern (Apr11 – March12)

Among the older lot, Rhino1 turned into a habitual strayer during this period and very often raided the crop fields along the south boundary of Bhuyapara range specially close to Kaljhar and Digjhari. A lot of effort was put in place involving the frontline staff and the other field staff



as well as the fringe villagers. Observation machans were put in place along the boundary with people armed with crackers and high powered searchlights, but the rhinos was very cunning and was able to give a slip quite often. This problem of raiding by the rhino agitated some of the

SI No	Month	Number of times damaged	Number of wild elephants involved in the damage	Damage location	Remark
1	April	3	2	Bhatghali	
2	May	4	3	Kahibari	
3	June	4	2	Bhatghali, Katajhar	
4	July	4	4	Bhatghali, Katajhar	Battery not charged properly due to cloud and rains
5	August	8	6	Palsiguri, Bhatgali, Katajhar	Battery not charged properly due to cloud and rains
6	Sept.	16	6-7	Palsiguri, Kahibari, Madlijhar, Bhatgali, Katajhar	1 set of Battery and Energizer got damaged
7	Oct.	20	6-7	Palsiguri, Kahibari, Madlijhar, Bhatgali, Katajhar	1 set of Battery and Energizer was not fully functional
8	Nov.	26	7	Palsiguri, Kahibari, Madlijhar, Bhatgali, Katajhar	1 set of Battery and Energizer was not fully functional
9	Dec.	4	2	Bhatghali and Katajhar	Battery replaced and Energizer repaired
10	Jan.	19	3	Palsiguri, Kahibari, Madlijhar, Bhatgali, Katajhar	1 set of Battery and 1 Energizer got damaged
11	Feb.	25	5	Palsiguri, Kahibari, Madlijhar, Bhatgali, Katajhar	2 Energizers and 1 Battery again got damaged
12	March	5	3	Bhatghali and Katajhar	Necessary maintenance undertaken, energizers repaired and battery replaced

Table3 : Monthly pattern of damage to electric fence

affected villagers and a number of measures were undertaken to keep the relationship strong and keep the support of the fringe community working for rhino conservation and protection. As a part of the measures, regular interaction with the affected villagers were organized and they were provided with knowledge of do's and do-not's on seeing a rhino in the vicinity. The villagers affected due to crop raiding by the rhino were identified and 50 of the most highly affected families they were provided with free seedlings in collaboration and support from the Agriculture Department.

During this period, 139 attempts were made by the rhinos to stray out of the park as recorded and of these they were successful for 85 times to stray out through different parts of the park through the un-fenced sections (Table2).

The electric fence has demonstrated its effectiveness for rhino since the commissioning in 2009, till date not a single incidence of rhino stray has been observed in the fenced section. It has been observed that regular and proper maintenance holds the key for keeping the fence in effective working conditions even against the elephants. Keeping the fence working during the monsoon and cloudy period was the biggest challenge as the battery do not get charged during the cloudy days and the energizers gets damaged at times during lightening. These materials cannot be repaired locally and is identified to be a big disadvantage. During this period, elephants very often damaged the fence in some very clearly identified locations specially when the fence was not working at its optimum. In the event of any damage to the standing fence, the repair is done immediately or the very next morning depending on the feasibility and type of damage. The fringe villagers values a working fence and a number of them from Roharpam, Palsiguri, Madulijhar, Katajhar and Kathalguri came forward to voluntarily help towards the maintenance of the fence.



Plate16 – Rhino17 during stray



Plate17- Villagers helping in maintenance

## Behavior and Feeding :

The field conditions and thick vegetation in the park made it very difficult for the team to successfully observe the rhinos physically, of the total number of locations identified for the rhinos, the individuals could be observed for only 38% of the times accounting for 1508 observations in total taking into account all the rhinos during this reporting period. It was very difficult to locate and observed the rhino individuals that did not have a functional radio collar.

During this period it was observed that the rhinos had overlapping home ranges and some of the females also stayed close to each other (<10mts), recoded for a few occasions. The females Rhino3 & 8 are often seen together in the grasslands. Rhino1, 2 and 5 were the main males and it was observed that Rhino5 had his own territory and very seldom came within the



Photo – Deba D. / WWF-India

Plate18 – Rhino2 & 6 during courtship

ranges of the other two males. Rhino1 and Rhino2 had overlapping territories to some extent but tried to avoid each other for most of the occasions. Both of them demonstrated aggression against each other and five major fights for dominance was observed during this period. Rhino1 mainly confined itself to the grasslands of the Rupahi – Kanchanbari area in Bhuyapara and also went out to the agriculture fields close to Betbari and Digjhar camps. Rhino2 was seen to be the dominating male primarily occupying the central and southern parts of Basbari range and enjoyed the company of the females mainly Rhino6 and the rehabilitated rhinos Mainao, Ganga and Jamuna. Courtship behavior was observed mainly during the later afternoon and evening and during once such occasion the radio collar on Rhino6 was bitten off by the male. Rhino2 was quite aggressive and was seen to be feared by some of the female rhinos. On one occasion, due to the actions of Rhino2, the female Rhino9 got injured in her posterior part and was seen to be mildly bleeding and after the incident she ran away to the west to cross river Beki and out of the range of the male on 22<sup>nd</sup> January 2012. On 19<sup>th</sup> March 2012, it was observed that the male tried to mount over the young female, Rhino11 and in the process she got some injury. The male was also quite aggressive towards the calves, specially the male ones and the mothers kept them protected. During once such incidence, the radio collar on one of the calf, Rhino14 was bitten off by Rhino2 on 21<sup>st</sup> March 2012. It was also observed that the mother – calf combination even after uniting after release in the park gradually moved away from each other and was occupying distinct spaces, Rhino3 & 4 got separated after about 28 days of getting released in the park and similarly Rhino12 and 11 got separated after about one month of their release in the park.



During this period, the Rhinos are observed to primarily grazing on grasses like *Cynodon dactylon (dubari)*, *Andropogon sps.* *Leersiahexandra (arali)*, *Cyperusrotendus (Keya bon)* *Cyperusiria (morphula)*, *Imperata cylindrica (Ulu bon)*, *Hymenachne assamica (dal ghah)*, *Cenchrurus ciliaris*, *Cenchrurussetigerus*, *Eichorniacrassipes (Water hyacinth)*, *Lemnamajor* and *Lemna minor (Puni species)*, several algae species. Rhinos were also found to feed on *Bihalangani (Amphineuronopulentum)*, *Dhekia (Diplaziumescullentum)* and other varieties of ferns, herbs, shrubs and creepers specially during the late or retreating monsoon (August – September). The Rhinos were also seen to eat the seeds of *Oxy (Dillenia pentagyna)* during July – August and also on the young and new leaves during March – April.

The rhinos were seen to illustrate some seasonal variation in their food selection and some of the successful observations are as listed –

SI No	Scientific name	Family	Season of feeding
1	<i>Casia tora</i>	Caesalpiniaceae	Summer
2	<i>Amaranthus spinosus</i>	Amaranthaceae	Spring, Summer, & Autum
3	<i>Amaranthus viridis</i>	Amaranthaceae	All round the year
4	<i>Cida equata</i>	Malvaceae	Winter
5	<i>Centrella asiatica</i>	Apiaceae	Winter and Spring
6	<i>Hydrocotyle sibthropioides</i>	Apiaceae	Winter and Spring
7	<i>Solanum torvam</i>	Solanaceae	Winter
8	<i>Oxalis corniculata</i>	Oxalidaceae	All round the year
9	<i>Spilanthes paniculata</i>	Asteraceae	Summer
10	<i>Dectyloctenium aegyptieum</i>	Poaceae	Summer
11	<i>Cyperus compressus</i>	Poaceae	All round the year
12	<i>Cyperus digitaus</i>	Poaceae	All round the year
13	<i>Astraceae sps</i>	Astraceae	All round the year
14	<i>Eurana lobata</i>	Malvaceae	All round the year
15	<i>Astraceae sps</i>	Astraceae	All round the year
16	<i>Digilaria sps</i>	Poaceae	All round the year
17	<i>Eragrostis sps</i>	Poaceae	All round the year
18	<i>Eleusine indica</i>	Poaceae	All round the year
19	<i>Axonopus compressus</i>	Poaceae	All round the year
20	<i>Commelina sps</i>	Commelinaceae	Winter



21	<i>Malastoma malabaricum</i>	Malastomaceae	Summer
22	<i>Malastoma sps</i>	Malastomaceae	Summer
23	<i>Rubiaceae sps</i>	Rubiaceae	Summer
24	<i>Comelina longifolia</i>	Comelinaceae	Summer
25	<i>Papilionaceae sps</i>	Papilionaceae	All round the year
26	<i>Paederia foetida</i>	Rubiaceae	All round the year
27	<i>Paederia husota</i>	Rubiaceae	All round the year
28	<i>Scrophulariaceae sps</i>	Scrophulariaceae	All round the year
29	<i>Pouzolzia sps.</i>	Urticaceae	All round the year
30	<i>Vallisneria</i>	Hydrocharitaceae	All round the year
31	<i>Premna herbaceae</i>	Verbenaceae	Spring and early part of
32	<i>Morus sps</i>	Moraceae	Winter and Spring
33	<i>Macaramga denticulata</i>	Euphoraiaceae	All round the year
34	<i>Carex sps</i>	Cyparaceae	Spring and early part of
35	<i>Sateria palmifolia</i>	Poaceae	Summer
36	<i>Fimbristylis aestivalis</i>	Cyparaceae	All round the year
37	<i>Sterculia villosa</i>	Sterculaceae	All round the year
38	<i>Mariscus compactus</i>	Poaceae	All round the year
39	<i>Cyperu rotundus</i>	Poaceae	All round the year
40	<i>Cynodon dectylon</i>	Poaceae	All round the year
41	<i>Bombax cieba</i>	Bombacaceae	Spring and early part of
42	<i>Dillenia pentagyna</i>	Dilaneaceae	Spring and early part of

Table4 : List of plant species consumed by rhinos in Manas NP

### Acknowledgement :

We duly acknowledge the Assam Forest Department for undertaking the Indian Rhino Vision (2020) Program along with all its partners and donors viz., - WWF, IRF, USFWS and BTC. We also offer our thanks to all the members of the Task Force for Translocation of Rhinos within





Assam and specially the Chief Wildlife Warden of Assam for having confidence in us and giving us the responsibility of taking forward this conservation program. We thank all the members of the TCC and its sub-groups who have helped in the implementation process in different stages and a special thanks to all the doctors from College of Veterinary Sciences, Khanapara (specially Dr. Kushal K. Sarma and Dr. Bijoy Dutta), Assam State Zoo, Aaranyak and WTI. We specially thank the support of the local community, the District administration, the Assam Police, the NGO's and the student body organizations without whose help and support it would have been very difficult to achieve success. Thanks also to Mr. S. Chand, IFS (CWLW, Assam); Dr. Susie Ellis & Dr. Bibhab Kr. Talukdar from IRF; Mr. Ravi Singh and Dr. A. Christy Williams from WWF; Mr. Fred Bagley and Mrs. M. Nagendran from USFWS; Mr. H. Choudhury and Mr. Jayanta Das from WADWT; Mr. G.C. Basumatary (CHD Forest, BTC) and Mr. Khampa Borgoyari (Deputy Chief BTC) for their continued support, encouragement and advice. Thanks to the Media, Police Department, Indian Army, SSB and District Administration for their much needed support. Last but not the least we acknowledge the dedicated efforts of all the officers and frontline staff of the Assam Forest Dept. posted in Pobitora, Kaziranga & Manas, the Conservation Volunteers, the Home Guards, members of the local NGO's. Very special thanks to the Nandan Kanon Zoo authorities, College of Veterinary Sciences and CCMB Hyderabad for their co-operation and to the officials from WWF-India who were always very helping and supportive.




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7. Singh D.M., Sharma A. and Talukdar B.K. (March 2011) : Translocation of Rhinos within Assam : A successful second round of the second phase under Indian Rhino Vision (IRV) 2020, Translocation Core Committee Assam.
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## Annexure – I

  
GOVERNMENT OF ASSAM  
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS, WILDLIFE, ASSAM,  
BASISTHA, GUWAHATI-29

No. WL/FG.41/ Rhino Translocation/ 2005                      Dated Guwahati, the 28<sup>th</sup> February, 2011

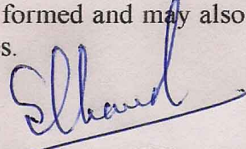
Consequent upon the transfer of Sri. D.M. Singh, IFS, the Translocation Core Committee is reconstituted as below –

1. Sri. Santosh Pal Singh, IFS, CCF (Wildlife) – Chief Operation Officer (COO)
2. Sri. Amit Sharma, WWF-India                      - Deputy Chief Operation Officer
3. Field Director, Manas TP                      - Member
4. Director, Kaziranga NP                      - Member
5. DFO, Guwahati WL Division                      - Member
6. Sri. Bibhab K. Talukdar, Aaranyak                      - Member

The Chief Operation Officer can co-opt any additional member with prior approval of the Chief Wildlife Warden of Assam.


Terms of Reference :

1. The TCC will be responsible for planning, executing, monitoring the capturing, transporting and releasing of the rhinos from the source PA's to target PA's.
2. The TCC will be responsible for planning and supervising the monitoring of the released rhinos in the target PA's and preparation of regular reports.
3. The TCC will constitute the different teams that may be necessary for executing the various activities in the source PA's viz.- Kaziranga NP and Pobitora WLS and the target PA's.
4. TCC will assign responsibilities and jobs to the teams formed and may also take the help of individuals to accomplish necessary activities.

  
[Suresh Chand, IFS]  
Principal Chief Conservator of Forests (Wildlife)  
and Chief Wildlife Warden, Assam



## Annexure – II

  
**GOVERNMENT OF ASSAM**  
**OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS(WILDLIFE)**  
**BASISTHA::GUWAHATI-29.**

No.WI/FG.41/Rhino Translocation/2005,                      Dated Guwahati, the 8<sup>th</sup> June,2012.


Consequent upon the transfer of Dr. S.P. Singh, IFS, the Translocation Core Committee is reconstituted as below –

- ✓1. Sri N.K. Vasu, IFS, CCF (Wildlife) - Chief Operation Officer (COO)
2. Sri Amit Sharma, WWF-India - Deputy Chief Operation Officer
3. Field Director, Manas TP - Member
4. Director, Kaziranga NP - Member
5. DFO, Guwahati WL. Division - Member
6. Sri Bibhab K. Talukdar, Aaranyak - Member

The Chief Operation Officer can co-opt any additional member with prior approval of the Chief Wildlife warden of Assam.

**Terms of Reference :**

1. The TCC will be responsible for planning, executing, monitoring the capturing, transporting and releasing of the rhinos from the source PA's to target PA's.
2. The TCC will be responsible for planning and supervising the monitoring of the released rhinos in the target PA's and preparation of regular reports.
3. The TCC will constitute the different teams that may be necessary for executing the various activities in the source PA's viz.- Kazirang NP and Pobitora WLS and the target PA's.
4. TCC will assign responsibilities and jobs to the teams formed and may also take the help of individuals to accomplish necessary activities.

  
(Suresh Chand, IFS)  
Principal Chief Conservator of Forests (Wildlife)  
and Chief Wildlife Warden, Assam.



## Annexure – III



**GOVERNMENT OF ASSAM**  
**OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS, WILDLIFE, ASSAM,**  
**BASISTHA, GUWAHATI-29**

No.WL/ FG.41 (A)/ TCC/ 2007

Dated Guwahati, the 29<sup>th</sup> November, 2010

### NOTIFICATION

In pursuance to the decision taken in 17<sup>th</sup> meeting of Translocation Core Committee the “**Manas – Monitoring Team**” is constituted as following. This is in suppression of all earlier notifications issued by Chief Operation Officer of the Translocation Core Committee.

1. Field Director, Manas TR, Sri A. Swargowari - Team Leader
2. Dy. Field Director, Manas TR, Sri C.R.Bhobora - Deputy Team Leader

#### **Field Monitoring & Security :**

3. FRO, Basbari, - Member
4. FRO, Bhuyanpara - Member
5. FRO, Panbari - Member

#### **Veterinarian :**

6. Dr. Prabhat Basumatary, FVO Manas NP - Member

#### **Monitoring / Research Support :**

7. Mr. Deba Kr. Dutta (WWF) - Member

#### **Advisers / Technical Support :**

8. Mr. Amit Sharma (WWF)
9. Dr. Kushal Sarma (CVSc, Khanapara)

#### Terms of references :

1. The team will be responsible for monitoring the released rhinos and shall maintain a day to day record, after taking over from the Release Team.
2. The team will also be responsible for ensuring security in the National Park.
3. The team will provide regular updates and shall work under the supervision and guidance of the TCC.
4. The team shall set-up a dedicated rhino monitoring cell / station and work in close co-ordination with the WWF-India team positioned in the Park.
5. The Team Leader will notify a dedicated rhino monitoring field team in all the ranges comprised of adequate numbers of forest personnel, armed guards and *kunkie - mahaut* for regular and round the clock rhino monitoring. The team will also take the help of individuals to accomplish different activities as necessary.
6. The Team Leader will submit a six monthly Monitoring Report to the TCC.

(D.M. Singh, IFS)

Chief Operation Officer, TCC and  
Chief Conservator of Forests (Wildlife),  
Basistha, Guwahati – 29



Annexure – IV

Date	Time	Location	Observer	Species	Sex	Age	Weight	Height	Length	Width	Remarks
14-11-19	10:30	...	...	...	...	...	...	...	...	...	...
14-11-19	11:00	...	...	...	...	...	...	...	...	...	...
14-11-19	11:30	...	...	...	...	...	...	...	...	...	...
14-11-19	12:00	...	...	...	...	...	...	...	...	...	...
14-11-19	12:30	...	...	...	...	...	...	...	...	...	...
14-11-19	13:00	...	...	...	...	...	...	...	...	...	...
14-11-19	13:30	...	...	...	...	...	...	...	...	...	...
14-11-19	14:00	...	...	...	...	...	...	...	...	...	...
14-11-19	14:30	...	...	...	...	...	...	...	...	...	...
14-11-19	15:00	...	...	...	...	...	...	...	...	...	...
14-11-19	15:30	...	...	...	...	...	...	...	...	...	...
14-11-19	16:00	...	...	...	...	...	...	...	...	...	...
14-11-19	16:30	...	...	...	...	...	...	...	...	...	...
14-11-19	17:00	...	...	...	...	...	...	...	...	...	...
14-11-19	17:30	...	...	...	...	...	...	...	...	...	...
14-11-19	18:00	...	...	...	...	...	...	...	...	...	...
14-11-19	18:30	...	...	...	...	...	...	...	...	...	...
14-11-19	19:00	...	...	...	...	...	...	...	...	...	...
14-11-19	19:30	...	...	...	...	...	...	...	...	...	...
14-11-19	20:00	...	...	...	...	...	...	...	...	...	...
14-11-19	20:30	...	...	...	...	...	...	...	...	...	...
14-11-19	21:00	...	...	...	...	...	...	...	...	...	...
14-11-19	21:30	...	...	...	...	...	...	...	...	...	...
14-11-19	22:00	...	...	...	...	...	...	...	...	...	...
14-11-19	22:30	...	...	...	...	...	...	...	...	...	...
14-11-19	23:00	...	...	...	...	...	...	...	...	...	...
14-11-19	23:30	...	...	...	...	...	...	...	...	...	...
14-11-19	00:00	...	...	...	...	...	...	...	...	...	...

Sample of the rhino monitoring dataset maintained by the IRV2020 monitoring team



## Annexure – V

### 1. Frontline staff involved in the monitoring of rhinos



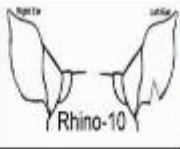

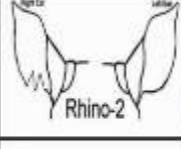

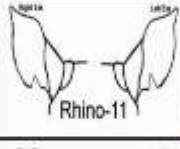

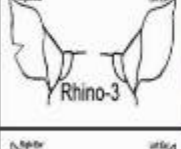



















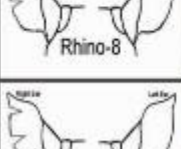







- A. **Basbari Range:** Prabhod Kumar Brahma (Forest Range Officer), Banjit Kr Das(Fr-I), Dipak Basumatry (Fr-I), Rajib Borgoyari (Fr-I), Emanuel Narzary (Fgd), Dilip Kumar Roy (Fgd), Uma Kanta Deka (Fgd), Prabin Roy (Fgd), Kumud Das (Fgd), Jatin Das (Fgd), Kusha Wary (Fgd), Ratan Basumatry (Fgd), Yusuf Khan Ali (Fgd), Nirmal Brahma (Fgd), Somesh Doimary (GW), Tapan Borgoyari(Fgd), Dhiren Musahary (CI), Anil Boro(CI), Ratul Basumatary(CI), Dhan Bahadur Magar (CI), Mon Mohan Pathak (Mahout), Biren Pathak (Mahout), Sumpul Grah (Mahout), Gopal Das (Mahout), Birenjoy Kerek Tanti (Mahout), Ratia Orang (Mahout), Modon Boro (Vol.), Nigam Basumatry(Vol.), Jatin Basumatry (Vol.), Sabharam Boro (Vol.), Monem Swargowary (Vol.) and a few more in addition to the departmental elephants and Mahouts.
- B. **Bhuyapara Range:** Labanya Ramchiary (Forest Range Officer), Adhan Ojha (Forest Range Officer), Bijoyananda Bhobora (Dy Ranger), Bhupen Pathak (Fr-I), Biren Boro (Fr-I), Ansum Boro( Fr-I), Lakhon Boro (Fr-I), Doithon Narzary (Fgd), Md. Akhtar Hussain( Fgd), Md. Hyad Ali (Fgd), Bolod Singh Narzary (Fgd), Sanjun Basumatry (Fgd), Bharat Ramchiary (Fgd), Belon Goyari (G/w), Nripenda Deka ( Fgd), Bongshidhar Das (Fgd), Akhil Haloi (Fgd), Kameswar Boro (Fgd), Mini Sarang Boro ( Fgd), Sanjor Biswas (Fgd), Pradip Das (Fgd), Lakhmi Borgary (Fgd), Ramen Choudhary (Fgd), Priyamoi Hazarika (Fgd), Hopna Mazi (Fgd), Prafulla Basumatary (Fgd) and a few more in addition to the departmental elephants and Mahouts.
- C. **Panbari Range:** Babul Das (Forest Range Officer), Doimalu Basumatary (Fr-I), Alombara Basumatary (Fr-I), Nagen Roy (Fr-II), Binit Roy (Fr-II), Md. Ismaile Hussain (Fr-II), Dane Basumatary (Fgd), Narul Ali (Fgd), Karim Ali (Fgd), Pradip Gayari (Fgd), Munaf Ali (G/w), Manik Das (G/w), Majin Sangma (G/w), Bilifang Brahma (G/w), Karunakanta Das (CI), Lonkeswar Barman (CI), Lonkeswar Boro (CI), Ganesh Boro (CI), Gopal Boro (CI) Indra Medhi (CI), Mahen Musahari (CI), Nibaron Basumatary (Vol.), Rindao Basumatary (Vol.), Bijen Basumatary (Vol.), Birsingh Boro (Vol.), Kabindra Boro (Vol.), Ranjan Basumatary (Vol.), Oangme Basumatary (Vol.) and a few more in addition to the departmental elephants and Mahouts.

### 2. WWF-India team involved in monitoring of rhinos in Manas NP

Deba Kumar Dutta (i/c), Jamir Ali, Bipul Nath, Iushuf Khan, Sande Doimari, Jawahar Sutradhar & Sarge Basumatary.

## Annexure – VI

# RHINO TRANSLOCATED TO MANAS NATIONAL PARK

 Rhino-1		Male from Pobitora WLS Capture Date -11-4-2008 Release Date -12-4-2008 Death in Oct. 2011	 Rhino-10		Female from Pobitora WLS Capture Date -8-1-2012 Release Date -9-1-2012
 Rhino-2		Male from Pobitora WLS Capture Date -11-4-2008 Release Date -12-4-2008	 Rhino-11		Female from Kaziranga NP Capture Date -19-2-2012 Release Date -20-2-2012
 Rhino-3		Female from Pobitora WLS Capture Date -27-12-2010 Release Date -28-12-2010	 Rhino-12		Female from Kaziranga NP Capture Date -19-2-2012 Release Date -20-2-2012 Death in May 2012
 Rhino-4		Female from Pobitora WLS Capture Date -27-12-2010 Release Date -28-12-2010	 Rhino-13		Female from Kaziranga NP Capture Date -19-2-2012 Release Date -20-2-2012
 Rhino-5		Male from Pobitora WLS Capture Date -17-1-2011 Release Date -18-1-2011	 Rhino-14		Male from Kaziranga NP Capture Date -19-2-2012 Release Date -20-2-2012
 Rhino-6		Female from Pobitora WLS Capture Date -17-1-2011 Release Date -18-1-2011	 Rhino-15		Female from Kaziranga NP Capture Date -11-3-2012 Release Date -12-3-2012
 Rhino-7		Male from Pobitora WLS Capture Date -17-1-2011 Release Date -18-1-2011	 Rhino-16		Male from Kaziranga NP Capture Date -11-3-2012 Release Date -12-3-2012
 Rhino-8		Female from Pobitora WLS Capture Date -17-1-2011 Release Date -18-1-2011	 Rhino-17		Female from Kaziranga NP Capture Date -11-3-2012 Release Date -12-3-2012
 Rhino-9		Female from Pobitora WLS Capture Date -8-1-2012 Release Date -9-1-2012	 Rhino-18		Male from Kaziranga NP Capture Date -11-3-2012 Release Date -12-3-2012





## Annexure – VII

### *About the Authors –*

1. Amit Sharma – Deputy Chief Operations Officer, Translocation Core Committee (WWF-India, Assam); email – amitsharma\_ghy@sify.com
2. Deba Kr. Dutta – Member, Manas Monitoring Team (WWF-India, Assam)
3. A. Swargowari – Leader, Manas Monitoring Team cum Field Director, Manas TP
4. Santosh Pal Singh – Deputy Director General ( Adm), Indian Council of Forestry Research & Education, Dehradun and Former COO, TCC

### Citation :

*Sharma A., Dutta D.K., Swargowari A. and Singh S.P. : The Released Rhinos in Manas National Park – The Fourth Year (April2011 - March2012), September 2012, IRV2020, Translocation Core Committee, Assam.*