

THE RELEASE OF CAPTIVEBRED CRANE CHICKS IN THE WILD
THE EXPERIMENT IN WEST SIBERIA
A REPORT

Prakash Gole

ECOLOGICAL SOCIETY, PUNE, INDIA.

SPONSORED BY MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA

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Executive Summary of the Report

To augment the numbers of the fast declining Western Flock of Siberian cranes wintering in KGNP, Bharatpur, it was decided to release captive-raised, isolation-reared crane chicks on the breeding grounds of Siberian cranes in West Siberia.

Accordingly in May 1992 Siberian crane eggs were taken to Russia from ICF, USA and Vogel Park, Germany, for hatching and isolation-rearing. The chicks hatched from the eggs were first isolation reared in the Oka Nature reserve near Moscow and in July 1992 taken to the breeding area in the Kunovat River basin in West Siberia. 2 Siberian and 2 Common crane chicks were taken to Siberia and Subsequently released in the wild.

The Common crane chicks were to keep company to the Siberian chicks and are expected to act as lead birds if the only alternative was migration of Siberian chicks with Common cranes who also breed in the same area.

The released chicks were first attracted to a Siberian juvenile who was from last year's brood. But when he was removed, the released chicks began to feed and move on their own. Subsequently weakest of the four chicks was killed by a Golden eagle.

Of the wild Siberian and Common crane pairs, the latter showed aggression to Siberian chicks but not to their conspecifics. The wild Siberian however, did not show any aggression but even was somewhat partial to Siberian chicks.

The expedition members succeeded in putting a satellite transmitter on the back of the chick of the breeding Siberian crane family.

The 3 released chicks began free-flying on 18th August and between 20th August and 25th August they had enlarged their feeding territory sufficiently to come in increasing contact with wild crane pairs.

On 27th August the 3 chicks migrated with the wild Siberian family leaving the Kunovat area. The satellite transmitters on the back of the wild Sibe chick and on the back of the released Common chick should now be relaying their migration route to the orbiting satellite.

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Introduction

Siberian Cranes (*Grus leucogeranus*) were found to be nesting in the Kunovat river basin of west Siberia, Russia in 1980. They were believed to be the same birds that migrate to Keoladeo Ghana National Park (KGNP) in India. As population of the flock wintering in KGNP was rapidly declining, a concern was voiced in ornithological meetings and crane workshops about their future. As protective measures were thought to be ineffective especially in the Iran-Afganistan-Pakistan region, augmenting the numbers in the flock by introduction of captive-raised chicks in the wild was suggested.

In the late 1980s isolation-rearing techniques were perfected for Sandhill cranes (*Grus canadensis*) and crane chicks who were not imprinted on any human beings were introduced into the wild Sandhill flocks. Concurrently the technique of putting satellite transmitters on wild birds was being developed. The crucial factor was the weight of the transmitter pack that would be tied on the back of a bird. Its weight was progressively reduced from 150-160 gms to just 60-65 gms as of today.

In 1988-89 transmitters were tied to the isolation-reared

Sandhill chicks and these were released among wild Sandhill cranes on their wintering grounds in USA. This experiment was first carried out by Meenakshi Nagendran, an Indian student studying in USA. It was her endeavour to find the migratory routes of Sandhill cranes by using the released chicks in the wild flock who were expected to migrate with them over the full distance. Actually the chicks migrated with wild cranes for some distance north but returned to their site of release as they were believed to be faithful to their breeding ground-- the site where the chicks hatched and were raised by crane-costume wearing Mini Nagendran.

International Crane Foundation, USA and Russian scientists who had discovered the Kunovat river Siberian breeding pairs, were watching Mini's experiment with interest. At first they were thinking of raising isolation-reared chicks in KGNP and releasing them among the wintering Siberian flock. But when they saw that the Sandhill chicks did not migrate with wild Sandhill cranes over the full distance but returned to their rearing site, they then decided that rearing and release should be tried on the breeding grounds of Siberian cranes in the Kunovat river region.

1991 Experiment in west Siberia

ICF in collaboration with Russian researchers began rearing and release experiments in the Kunovat river basin in the spring of 1991. In 1990 satellite transmitters were successfully mounted on Common cranes (*Grus grus*) breeding in that area. The route of their migration was traced right upto Iran-Afganistan border. It

was therefore, thought that isolation-reared chicks mounted with satellite transmitters should be released in the Kunovat region, their local movements monitored by radio and if they migrated with wild Siberians, their migration route traced with the help of satellite transmitters.

Mini Nagendran was put in charge of this experiment from the US side. Fertile Siberian eggs from ICF, Vogelpark, Germany and Oka Nature Reserve, Russia were used for hatching. Out of 8 eggs 6 hatched but 5 survived for isolation-rearing. Mini took them under her care and raised them near the territory of a nesting Siberian pair breeding in the Kunovat basin. She raised them wearing a crane costume, with recorded crane calls and without letting them come into contact with any human being. They were later released near the Siberian breeding territory. But before the chicks and wild Siberians became familiar with each other, wild Siberians migrated south. Chicks had then to be herded back to their pens by Mini and then were taken back to Oka Nature Reserve near Moscow.

It was decided to continue the experiment in the spring of 1992.

1992 Experiment in west Siberia

In May 1992 Mini carried Siberian crane eggs again from ICF and Vogel Park for incubation in Oka Nature Reserve in Russia. They were hatched and reared in May & June in the Oka. Ultimately

one juvenile Siberian crane which was released in 1991 and had to be recaptured and 2 Siberian chicks hatched this year were taken to the Kunovat release site. They were accompanied by 2 Common crane chicks, one of them obtained from a wild Common crane pair breeding in the Oka and one from an egg hatched in the Oka.

Till June Mini isolation-reared these chicks in the Oka. They were taken to the Kunovat site in the beginning of July and Mini familiarised them with the marshy terrain and natural food such as insects and berries. Upon fledging the chicks were released in the marshes in August. Even at night they were not called back to their pens to be kept there. The chicks carried identification bands. One Siberian chick (named Bugle) was equipped with radio transmitter to track local movements and one Common chick was equipped with satellite transmitter. It was at this time I joined the research team. I had flown to Moscow from Bombay on 5th August but had to spend some days in Moscow before the rest of the party who were to travel with me assembled there. During those four days I met officials from Indian embassy and Russian ornithologists working on cranes and wetlands. I could also visit a nature reserve near Moscow. My intention to visit the Oka could not be fulfilled due to transportation difficulties. Accompanied by Dr Alexander Sorokin I flew to Salekhard on the delta of the Ob river on 10th August. The Kunovat camp site was about 200 kms south of Salekhard. We spent a day in Salekhard equipping ourselves and purchasing essentials

for the camp and were dropped on the camp site by a helicopter on 12th August 1992.

My Observations in the Wilds of Siberia

The helicopter was also to be used for surveying the breeding grounds of Siberian crane pairs around the site with a view to locate a pair with a non-flying chick that could be captured by hand to mount a satellite transmitter on its back. Accordingly before approaching the camp site we made circles over the surrounding area from a height of about 500 ft. and located 2 pairs and a juvenile which was the chick released last year but recaptured and released again this year. We however, could not locate a pair with a chick. The intention of mounting a satellite transmitter on a chick could not be carried out on that day. I however, got an opportunity to photograph the tundra and taiga topography extensively from the air.

We were greeted on the Camp by Mini Nagendran, Dmitri and Dr Yuri Markin, the advanced team who were there since the beginning of July.

The Camp Site

The camp site was located in a forest surrounded on all sides by marshes. It was about 4 kms southwest of the Kunovat river. The forest around the camp consisted mainly of *Pinus sibiricus* and *Betula* sp. with shrubby undergrowth in which many edible berries flourished. About 1 metre below the surface the

ground was frozen providing ready refrigeration for camp supplies. As the ground was wet and damp, tents in which we lived were placed on platforms made of wooden planks. Outside the tent we had to walk wearing waist-high rubber boots and thick-set clothing with net over our heads to avoid insect (gnats, flies and mosquitoes) stings. If the weather was good hordes of these insects made life miserable.

To the south of the camp, at a distance of about 0.5 km, began a vast, open marshy terrain in which the chicks were released. In this terrain were scattered "islands" of dead and decaying forest trees and patches of living forest. A blind or hide placed on a birch tree about 10 metres above the ground overlooked the marshy vista. Far to the south about 1 km from the hide lay the territory of a wild Siberian crane pair and towards southwest a Common crane pair had their territory. Movements of chicks in this marshy terrain and those of Siberian and Common crane pairs when they chose to come out in the open, could be observed from the tree-top hide.

About 300 metres from the hide in the marshy terrain was placed the crane costume on a pair of sticks. This was the surrogate mother to assure chicks in the wild. It was also the feeding station for the released chicks. Prepared crane food and wheat were placed in little bowls around the "mother" to enable chicks to feed if they could not obtain their natural food in sufficient quantities. As chicks were imprinted on the costume, it served as a pseudo mother. Its scare-crow like look helped to

keep away predators and even wild cranes if the breeding pairs proved aggressive towards chicks.

The main duties on the camp consisted of observing chick movements and their interaction with wild breeding pairs from the hide and tracking the movements of chicks by radio if they remained out of sight. As satellite transmitter had yet to be mounted on a wild chick, tracking a wild pair with a chick and shadowing it to grab an opportune moment to capture the chick for transmitter mounting was also one of our prime objectives. For our own sustenance we partly lived off the land by hunting wild ducks and catching river fish for food besides using usual camp supplies of tinned food, milk, bread and tea.

I soon assimilated myself in the daily routine of observations from the hide and walks in the surrounding marshes and forests to follow chicks and other wildlife.

My Days in the Camp

Fortunately on the first day of my arrival, we observed that the pair whose territory adjoined the release site, had a chick with them. This was most fortunate as it meant that no great distance need to be travelled to accost the pair and wait for an opportune moment to grab the chick. On 14th August therefore, Dr Sorokin and Yuri Markin left camp early to try and capture the chick for transmitter mounting.

When they reached the forest south of the Siberian pair

territory, they could not immediately locate the pair. They had to wait 6 hours in the forest till the Sibe family came into the open marsh. When they ascertained that the chick could not fly, they advanced into the marsh. The parents flew away giving alarm calls and the chick lay hidden in tall grass in the marsh. They then tried to locate the chick by climbing nearby trees. Fortunately Sorokin spotted the chick crouching in a slight depression and ran and grabbed it. Soon Yuri joined him and they strapped on him the transmitter. Before releasing him they took the chick's measurements and weighed him. The chick tried to defend himself bravely often jabbing both by his beak and showed his anger even after release. Then it quietly strode away in the direction of his parents who were still calling in alarm from a distance.

Thus was achieved a major goal of the expedition, viz. to mount a satellite transmitter on a wild Siberian crane. Now when this chick flies south with its parents, the transmitter will beam to the orbiting satellite its whereabouts which will help us understand their migration route.

Bugle Retaken

As we began observing the behaviour and movement of chicks it became slowly clear that the focal point of interest for the chicks was not the wild crane pairs but the elder chick called Bugle who was from the last year's brood. This juvenile, a male, was now flying freely, subsisting mainly on wild food but sometimes returning to the feeding station of chicks to feed. He

was not afraid of the scare crow as it was imprinted on this "mother" when he was an infant. He was the dominant male when chicks were around though he never attacked them. But on several occasions he chased them, especially the youngest to near exhaustion. Indeed whenever he was to be seen the chicks tried to follow him as if he was their leader. But as he was free flying and older, he was often to be found alone, away from the four chicks.

As days passed we felt increasingly that as long as Bugle remained free, the chicks would be attracted to him and not to the wild cranes. It was therefore, decided to capture him and send him back to the Oka Reserve. Later in the year he might be released in India when he would be old enough to forge a bond with a wild Sibe female from the flock in Bharatpur.

We then awaited the moment when he could be seen with our 4 chicks. We also noticed that his leg on which a radio transmitter was strapped was not normal and he was having problem walking. It was necessary he received proper medical treatment.

It was on 16th August we noticed the five of them together. Immediately Mini put on her costume and went out to lure him by food. He was now wild enough not to receive food from the beak of the costume. Sorokin and Yuri also with costumes on waited in the forest if Mini needed any help. With taped contact calls on, Mini slowly moved among chicks feeding them and comforting them. Bugle was a little away from the foursome and Mini kept edging towards

him. When she was sufficiently near, Mini jumped and caught him. Sorokin and Yuri ran to help her. The three of them put a mask on his face to calm him, wrapped him in a cloth and brought him to the camp. He was kept in a large pen adjacent to the pens where chicks used to be kept.

The chicks soon found that he was penned and began visiting him from time to time. At first the chicks visited him 3 to 4 times a day, walking around the pen feeding and crooning. But as days passed the number of visits declined and the time between two visits lengthened till he was removed from the pen and sent back on 26th August.

Mini treated his leg which soon healed and by 26th August he was walking normally.

In removing Bugle our aim was to make the foursome independent to stand on their own legs so to say, to prepare them to face the vicissitudes of life in the wild. We no longer fed them the crane food and could observe that they were spending more and more time away from their feeding station near the scare crow. It was therefore, decided to remove this psuedo mother. If the scare crow was removed, it was felt that the wild cranes could also move more freely in that direction reducing the distance between them and the chicks.

It was on the 18th that we saw chicks flying for the first time, two days after Bugle was penned. Wing-flapping and practice

runs preceded their actual flight. The two Common chicks were the first to take wing followed by Nadia, the taller of the two Siberian chicks. Only Hope, the younger Siberian chick, was slow and while the three flew he ran and tried to keep pace with them.

When we saw the three chicks flying freely, we removed the pseudo mother on 18th August. That was the last day we fed a little wheat to them. Thereafter chicks were left entirely to fend for themselves. Mini was worried about Hope who she felt might be weakened without feeding and his flight delayed further. But on 19th August Hope lifted himself for the first time and flew almost 500 metres before touching ground again.

On 20th Aug. we spent the whole day visiting a village of hunter-gatherers while Yuri kept a watch on the chicks. When we returned late at night, he had some disturbing news for us. Chicks had been feeding in the marsh on the borders of territories of Siberian and Common cranes when suddenly the male Common crane threatened them. On 16th August we had observed this male quite close to Common chicks. He fed quietly and stood normally within 20 metres of them. He showed no aggressive behaviour. But on 20th he was different. When he threatened chicks with a unison call and threat display, the three who could fly immediately withdrew but poor Hope was slow. He was attacked by the male who thrashed his back with his feet. Twice Hope was

thrashed in like manner. A white-tailed eagle who was also present, tried unsuccessfully to attack Hope when the male Common crane went back but Hope escaped and joined the other three. Yuri who was watching them put on the crane costume, went to the chicks and examined Hope. He saw no injury, neither blood nor broken limb. Hope appeared normal though a little shaken by this experience.

When Mini saw him flying the next day, we felt that the drubbing he received spurred him to fly better and he should now be able to join the other 3 wherever they went.

Later when on 21st August, I observed the chicks, Hope walked while the other chicks flew. On 22nd August Mini and Yuri saw only Hope near the feeding station while the other 3 were near the pen where Bugle was kept. This meant that Hope was once again not keeping pace with the rest and had difficulty in flying. Mini was worried about Hope now. We even discussed the plan of recapturing him and sending him back with Bugle.

In the evening on that day the first meeting of wild Sibes and our chicks took place. The male Sibe came to the usual foraging marsh of the chicks well beyond the border of his territory and kept searching for food and preening near the chicks. The chicks responded in the same way and were not worried by his presence. Mini recalled that last year also the same sequence was witnessed. Moreover, he appeared to be oblivious to the presence of Common chicks, paying greater attention to the

Sibe chicks. If Nadia the flying Sibe chick, could become a part of the Sibe family, he was very likely to migrate with them, we thought.

The End of Hope

But Hope was causing real concern now. The whole of 22nd August he remained near the feeding station and never accompanied the other three who spent late morning hours near Bugle's pen. Mini was now plainly alarmed. Hope was clearly in difficulties, probably too weakened to fly. Mini wanted to help Hope, feed him, examine him and if necessary recapture him. But Dr Sorokin urged caution. He felt Hope would recover in a day or two. The cloudy weather and fall in temperatures for the last 3 days had depressed insect numbers and chicks might have had difficulty in getting enough insect food. We have been observing chicks feeding mainly on blue-berries.

The rain that had been falling for the last two days ceased around 10 a.m. on 23rd August. In the morning chicks were near Bugle's pen and Bugle was giving contact calls. At 10 a.m. I saw chicks flying above our camp but Hope was not with them. He was still near the feeding station and Mini, when she observed from the hide, felt Hope's condition had deteriorated. She wanted to go and help him but Dr Sorokin still felt that chicks should be left to fend for themselves. At lunch Yuri, Mini and I were still discussing the future of Hope when Dr Sorokin was seen running back from the hide. When he saw us he shouted, "Golden eagle had

killed Hope!" Yuri immediately put on his marsh boots and both of them ran to the marsh in the direction of the feeding station. Mini was too overwhelmed to register any reaction and simply walked away stunned. I walked in the direction of the marsh more to see what Yuri and Sorokin would bring back than to do anything. Soon they returned with the dead chick.

The chick weighed 4.3 kgs and his entrails showed that he was mainly feeding on blue-berries. We could not detect any disease except a single parasite in his intestine. His tissue was taken for examination. We wondered if his flying disability was genetically induced.

The Last Days in the Camp

Mini and I left camp on 26th morning to go back to Salekhard. Hope died on 23rd August and observations during the next 2 days showed that the three flying chicks had widened their foraging radius and were often to be found to the northwest of the camp out of sight from the hide. Their whereabouts could only be known from the radio. Once a while they still returned to the pen where Bugle was kept but did not spend a lot of time near him. On 25th when I was looking from the hide, the chicks were not to be seen. Earlier even Mini and Yuri had not seen them. The radio told us that they were still to the NW of the camp. Later in the afternoon when I went to the marsh to the east of the camp, I saw them feeding on insects from the grass in the marsh. Of the 3, one Siberian and one Common kept together. While the

third chick kept a little apart. Later Dr Sorokin and Yuri also observed them in the same area.

Before leaving the camp on 26th Aug. we tried to track them by means of radio and located them again in the NW direction. We thought they probably had located a good feeding ground as they were spending a lot of time there. It was probable that they were in contact with wild Sibe and Common cranes whose territories converged in that direction. We could of course, not see enough close encounters between wild cranes and the chicks. In fact the Memorandum of Understanding that we signed on 24th August took this fact into account and mentioned our intention to continue this experiment in KGNP if the chicks could not migrate from Siberia with wild cranes. In KGNP we planned the release of slightly older chicks like Bugle into the wild flock. We hoped that these juveniles should be able to forge a bond with wild cranes in the flock.

On 26th August we left for Salekhard while Dr Sorokin and Yuri Markin stayed back to observe how things progressed till wild cranes migrated. This they thought would happen during the first week of September.

Migration

As we go to press the news arrived that the 3 chicks flew with the wild Sibe family and left the Kunovat area on 27th August. The last objective of the experiment appears to have been

achieved. Now the two satellite transmitters that the wild Siberian chick and our Common chick are carrying should relay their whereabouts while on migration.

Conclusion

1. Isolation-rearing is evolving as a very useful technique for the release of captive-bred cranes into the wild.
2. In the Kunovat region the breeding Siberian and Common cranes are scattered over a vast area holding large nesting territories where it appeared that the release of chicks in a particular area might not bring them into contact with wild cranes on many occasions.
3. Moreover, the pseudo mother acting like a scarecrow though provided comfort to the chicks, deterred wild cranes' contact with the released chicks. It appeared that its removal promoted greater contacts.
4. The introduction of an older chick in the released flock posed some intra-specific problems. It therefore, seems that the released chicks should be of the same age.
5. It is necessary to observe closely how the released chicks adapt to the wild conditions. The supply of food in the wild appeared to depend on weather conditions, especially the availability of insects. Non-availability of proteinous food is likely to induce weakness which may prove fatal in the wild.

6. The nesting wild crane pairs tend to be aggressive on their breeding territories leading to aggressive inter-specific behaviour. At one point it appeared that this aggressive behaviour might prevent proper assimilation of released chicks with wild pairs. However, migration of chicks with wild crane family appeared to belie this fear.

7. The continuation of this experiment, on wintering grounds therefore, holds great promise as cranes on wintering territories appear to be less aggressive than on their breeding territories and the chances of older chicks forging a bond with wild cranes are thus better.

8. The Memorandum of Understanding that we signed at the end of the experiment contains our recommendations and the future Plan of Action.

Acknowledgement

I am grateful to the Ministry of Environment & Forests, Government of India, for enabling me to take part in this unique experiment. I am also grateful to International Crane Foundation, USA, and All Russian Institute of Nature Conservation, Moscow for their cooperation and assistance throughout my stay in Russia. To my colleagues in the camp I owe a special debt of gratitude for their friendship and camaraderie. The immense help of my friend Joost van der Ven can never be forgotten. He may probably not like it to be acknowledged formally.

A MEMORANDUM OF UNDERSTANDING SIGNED BETWEEN ORNITHOLOGISTS
FROM RUSSIA, UNITED STATES AND INDIA DURING THE EXPEDITION
TO THE KUNOVAT RIVER BASIN IN RUSSIA'S WESTERN SIBERIA.

Preamble:

From May to September 1992 an experiment was carried out on the breeding grounds of Siberian crane (*Grus leucogeranus*) in the Kunovat river basin in West Siberia, of isolation-rearing and release of Siberian and Common cranes (*Grus grus*) in the wild. In this experiment ornithologists from the Institute of Nature Protection, Oka Reserve, Kunovat Refuge and Moscow Zoo (all from Russia); International Crane Foundation and Patuxent Wildlife Research Centre (both from USA); and Ecological Society, India participated. Siberian chicks were hatched from eggs that came from ICF and Oka Reserve. One Common crane chick was obtained from the wild Common cranes breeding in Oka Reserve and another Common chick was obtained from captive-hatched egg in Oka. These 4 chicks were isolation-reared in Oka in May-June 1992 and this rearing was continued in the Kunovat region in July. Chicks were released in the wild in August upon fledging. The release of these took place in the breeding territory of wild Siberian cranes.

At the time of release the chicks were well-adapted to conditions in the wild and behaved like wild cranes. One Siberian chick was equipped with a radio transmitter to track local movements and one Common chick was equipped with satellite transmitter. All of them carry identification bands. Since release they are in contact with wild Siberian crane and Common crane pairs.

Scientists participating in this project have successfully deployed a satellite transmitter (PTT) on a chick from the wild Siberian crane family in whose territory the chicks were released. This was the first deployment of a PTT on wild Siberian cranes. This will help in understanding the migration route of this population of Siberian cranes. Significant data were obtained on the breeding biology of Siberian and Common cranes. Common cranes breeding in this region are a great help as possible guides and/or foster parents for Siberian chicks.

The Plan for the Future:

In continuation of this experiment, the following needs to be done on the wintering grounds of the Western Population of Siberian cranes:

1. To release well-adapted Siberian chicks in Keoladeo Ghana National Park (KGNP) in India.

2. To release well-adapted Common crane chicks in Tyumen in Russia with the possibility of a Siberian chick also.
3. For release in India during the winter of 1992-93, two to three Siberians will be transported from Russia and potentially one to two Siberians from ICF, USA.
4. To acclimatize these birds in KGNP before release, Release Pens should be provided in KGNP, India.
5. Because Common cranes are so important in this experiment, they should also be marked with PTTs not only on their nesting grounds in the Kunovat region but also on their wintering grounds in India and Iran.
6. To accomplish the work in India 2 to 4 PTTs will be required to be put on the released Siberians and wild Common cranes.
7. For this work it is necessary to have 2 Russian and 2 US scientists who have already participated in this experiment, come to India to train Indians and to see that the experiment is successfully carried out in KGNP. DETAILS OF THEIR JOURNEY TO AND WORK IN INDIA NEED TO BE FINALIZED BEFORE 1st OCTOBER 1992.
8. To determine alternate wintering grounds of Siberians in India, an aerial survey of possible wintering sites needs to be carried out during the winter of 1992-93.
9. As the western population of Siberian cranes is in a precarious condition, it is necessary that their breeding grounds in the Kunovat region be fully protected and are an inviolate territory.
10. To continue this work in 1993, a cooperative experiment will be conducted to release Siberian cranes utilising recently acquired knowledge and in addition cross-fostering will also be carried out by putting Siberian eggs in Common crane nests.
11. Because the Western population of Siberian crane is fast declining, countries where Siberian cranes are found, should cooperate and coordinate their efforts.
12. As a first step India and Russia should coordinate and formalize their efforts through an agreement under the umbrella of the bilateral convention on Protection of Migratory Birds and their Habitat.

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and Ministry of Environment and Forests, Govt. of India.

Signed: from Russia

from USA

from India

Dr A. Sorokin

Ms Meenakshi

Mr Prakash Gole

Dr Y. Markin

Nagendran

Date 24 August 1992

Camp, Kunovat River.

