

Wuthering Wild

ENVIS-RP Newsletter on Biodiversity & Traditional Knowledge



Devsat Singh | photography

BEHAVIORAL ECOLOGY OF INDIAN
GREY WOLF (*Canis lupus pallipes*)

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From the Coordinator's Desk



It is with pleasure that I present the 'April to June 2021' issue of *WUTHERING WILD* newsletter for the first quarter of the financial year 2021-2022, covering snapshot of the various activities and advancements of the center.

In this quarter, Save The Frogs Day on the 25th April, International Day for Biological Biodiversity on 22nd May and World Environment Day on 5th June, World Bicycle day on 3rd June were held and on these

occasions, online competitions like Frog race, Poster competition, Slogan writing, Rangoli, Quiz and Power Point presentation on various Biodiversity, wildlife and Environment and An International Symposium on International Day for Biological Biodiversity from 22nd-23rd May 2021 also organized. The International e symposium concludes with very important message that today in scenario of Covid-19, special emphasis given on biodiversity & its conservation, India is known for its floral and faunal diversity as well as find the way for conservation of biodiversity at Global Level. The e symposia mainly focused on analyze global terrestrial, freshwater, and marine biodiversity scenarios using a range of measures including extinctions, changes in species abundance, habitat loss, and distribution shifts, as well as comparing model projections to observations Scenarios Globally. It's time to join hands and works together in collaboration for conservation of biodiversity and also should be emphasis on participation of local community in conservation.

Additionally, for this issue, Mr. Devvrat Singh from Environmental Science, Department of Environmental Science, Integral University, Lucknow has contributed some interesting research of their field. Mr. Singh is working on Behavior Biology Biodiversity, Conservation as well as restoration. Wolves have been identified as a schedule-1 species in the Wildlife Protection Act-1972 and are a subject of major concern. Records of certain locations that were taken to initiate the conservation plans for wolves (like the Blackbuck National Park), say that the population is rising gradually but at other places, especially those which are not covered in reserved areas or protected areas, the number is still going down. Government is seeking for better corridors and habitats for wolves. Efforts to avoid human wolf conflict are strongly needed from the side of farmers and people of rural sector. Such efforts may include- not be killing the wolves at first place, putting electric fences with low voltage around the field, not letting children escape to suspected areas of wolves living, not letting their cattle to graze in forest areas, setting free the guard dogs, and also monitoring the fields regularly with utensils, sirens, hooters or bells making noises to scare away the wolves.

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Behavioral Ecology of Indian Grey Wolf (*Canis lupus pallipes*)

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INTRODUCTION

Indian wolves have a shoulder height of around 57-72cm (22-28 inches) and a length of about 103-145cm (41-57 inches) from nose to tail. Weight of males ranges from 19-25kg and that of females about 17-22kg. Indian wolves have a greyish red to reddish white fur with a dark back strip running from behind the shoulders to the tail. The tail has a black tip. The underside of the Indian wolves is generally whitish. The adult wolves are characterized by an inverted dark V-mark on their shoulders. The pups are usually sooty-brown in color, with a milk-white patch on chest which fades away with age. Black colored wolves have been reported in Solapur district. The Indian wolves have steeper face and a nearly straight back. They have an excellent hearing, normal eyesight with good straight vision and peripheral vision and excellent smelling ability. There are about 2500-3000 wolves remaining in the wild in India as suggested by the report of Zoological Survey of India and Dr. Y.V. Jhala, and these are kept in Schedule-1 species. The Indian wolves are different in many ways from the grey wolves of the west or European countries, in terms of size, coat, howling, etc. In India, two sub-species of grey wolf are found namely: Indian Grey Wolf (*Canis lupus pallipes*) and Himalayan wolf (*Canis himalayensis*). This article is about the ecology of the Indian grey wolf. Indian grey



Animalia
Chordata
Mammalia
Carnivora
Canidae
Canis
C. lupus
C.l. pallipes

Figure 1. Source: Devvrat Singh

wolf ranges from Southwest Asia to the Indian subcontinent. In India, the wolf has an image of a cunning and blood-thirsty animal and is overlooked in terms of conservation.

REPRODUCTION

The breeding season for the wolves is winters-springs, when there is ample of prey and no scarcity of food and water. The temperature also supports the survival of the puppies, as it prevents them from any unnecessary exertion and if needed to alter the temperature inside the den, it is easier for female to give warmth to the pups through body heat. Only the alpha pair is allowed to breed. The other members are usually the litters of the couple from different years. The alpha male and female, after the courtship period, which might range from a few days to several months, copulate. The male would smell and lick the female around her pelvic region and finding her ready to mate will copulate with her. Each time the copulation can last for 20-30 minutes. The pair copulates many times in a period of 5-7 days which is the estrus period. The mating season of the wolves starts from mid October and ends in last of December.

● Parenting and pups

The parenting behavior of wolves unfolds many aspects of their wisdom and family bonding. The female starts digging a den about one and a half months prior to giving birth. During this process, the female generally chooses a place slightly away from the general stay of the pack. The digging is done solely by the female but the alpha male turns up for help at times, but it's just to assist the female and does not take complete responsibility of the workload. Wolves dig a den which is about 8-10 feet in length and about 18-20 inches in diameter. The female will skip to go on the hunt if she is too tired; instead, she joins the pack straight on the meal. During gestation period, the female is looked after well by the other pack members and alpha male develops a special sense of care, affection and helping nature for the female and usually stays close to the female to fulfill any requirement and to protect her. After a gestation period of 60-62days, the female gives birth to a litter of 2-6 pups. The pups are born with no vision at the time of birth. They develop a blurred vision after 12-15 days and start seeing completely after 21-23 days. Throughout this time, the mother is excessively careful toward the pups. Only mother is allowed inside the den, who does not allow even the alpha male to peep into the den. The mother

covers the pups with her body, folding her body like a semi-circle and all the pups rest right next to her nipples. The mother rarely leaves the den and every time she does this, she ensures the complete precaution of the den and pups, keeping one eye at it constantly. She never gets more than a few meters away from the den. While she is out, no member can come less than 10 meters close to den. The mother constantly keeps cleaning the den. The cleaning of the neighbouring areas of the den is looked after by the alpha male. While she is taking care of the pups, she is constantly fed by the other pack members. Milk-teeth of pups start germinating by the age of 3 weeks. Before then, the pups feed on milk. After about two months, the pups start coming out of the den and play at the mouth of the den. Once they start coming out from the den and playing, they are welcomed by all the other members of the pack, who gather around them, wagging their tails, smelling them, and cheering with squeaks and chirps, also jumping around them and licking them. The pups also show interest by biting the nozzles of their elders and by sitting on their hind-limbs and trying to embrace elder's nozzle with the fore-paws and licking and smelling them. Until the pups are about 4 months of age, they are fed by the other pack members who go on the hunt. The elders eat more than usual and come back vomit out the semi-digested food which the pups lick and swallow. It's more like feeding a baby soup to a human baby. During their fifth and sixth months, they start eating some parts of flesh as well as the food vomited out by others. The female starts leaving the pups with a caretaker and starts joining the hunt when pups are about 6 months of age. The caretaker can be any wolf of the pack, generally it's the omega. The wolves also develop special bonding with each other in a manner similar to that of humans; each wolf connects to another wolf in different manner. The wolf, other than the alpha pair, who forms a good relationship with the pups, becomes the caretaker. The pups start joining the pack on meal after six months of age. The period from fourth to sixth month in a pups life is a period of learning basic things viz.- which objects to get close to and which not to, first instinct on seeing a danger, how to establish their position in the pack, etc.

● Teaching and learning behavior

The pups' early age games include fight with each other, chasing small animals whom they can scare away and practicing their natural instincts of hunting; albeit, they start practicing on small animals like rodents or birds when they are about eight months of age. Also, it is almost the same age of eight months, when the pups start going with the pack on the hunt, though, they only observe from a distance how the hunt is being conducted. Wolf pups learn in the same manner as the human babies, by observing and imitating the elders. They copy down

each activity of the adults in exact same manner, which includes the selection of the prey, forming strategy, holding position in the game, chasing, tackles, tricks, smothering the prey, etc. Any slight change in the hunting behavior of the adult wolves will result in the new understandings and change in the learning of the pups and they will start practicing on the new grounds of their learning. This can alter the hunting pattern of the upcoming generation completely. When, about one year of age, they start joining the hunt. The wolves attain sexual maturity when about 18 months of age.

RANKING IN A PACK

It starts getting clear from the game pattern of the pups, as to which pup will hold which position in future, although ranking changes depending on the behavior and personality of the wolf. The ranking is independent of the size, but it does depend on the personality, activeness and smartness of the wolf. Indian wolves are generally found in pair, which is an alpha pair, but, when a pack is formed, its size can vary from 6-12 members. The Alpha pair is compulsorily present in the pack as they are the ones who form the pack by reproducing. The apex ranking in a pack is of Alpha male, who is the leader of the pack and decides on issues like settlement, territory, hunt, and is the only male who can mate. The female he chooses to mate becomes the Alpha female. The Alpha pair is generally the eldest member of the pack but the male can be sometimes challenged by another pack member. Alphas can be identified by an erect posture with erect ears and lifted tail. There is a Beta member which comes second to the alphas in hierarchy. There are mid ranking wolves which come after the Beta, but it depends on the size of the pack. The omega is the most suppressed member of the pack and its role is to be an object of play for others, and he is the one who comes in between the fights to bring down other wolves' temperament. He is the last one to eat. It can be identified by its curved back, ears pushing backwards, and tail generally folded between its legs. Omega is considered to be the most timid of all the members. The wolves start developing special relation with each other at a very early age and can significantly behave differently towards each other.

HIGH INTELLECT OF WOLVES

The wolves are creatures of very high intelligence and have a very high sense of understanding and intellect. They can actually analyze whatever new things are going on around them and can manipulate their behavior if they find that anything strange is around. Wolves are very adaptive to any new stimulus around them and also to new habits. This makes it more difficult to study wolves, as they are shy creatures and also can manipulate their natural behavior if they find that they are being observed.

● Playing games and learning

This can make the study, all vain, if one fails to record the original behavior of wolf in the wild. The wolves regularly keep sniffing around and testing whatever small things are around them. Wolves of every age are fond of playing and digging, or experimenting new skills or objects. Their games include play fights, chasing each other, picking up small objects like leaf, branches, twigs, animal fur, peels etc., and running and snatching them from each other. Wolves also play game of hide and seek, and also they sometimes hide small preys and then search for it. All the games are related to the refining of their hunting skills like smelling, chasing, fighting, strangling, etc. and strengthening family bonds. These games build up a sense of connectivity among wolves, strengthen their bonds and keep them together.

ACCOMODATION TO SEASONS

Wolves might spend entire day sleeping or playing, and become active at night. As they are fond of digging, they make good den sites by scouting a place and spend their days in summers inside the den, sleeping. At times two wolves might share a single den, especially the alpha pair does this if there are no pups. If there is mild and cool breeze blowing during summers, they would dig a place until moist soil starts surfacing, and would sleep on that throughout the day time. They shed much of their fur and fat during summers in order to avoid exertion and to cut off heat. Remaining furs and fat is called the summer coat. The coat of wolves consists of longer and harder hair which make the outer coat; and soft, dense and short hair which form inner coat. The coat color may change a little after every fall, but it's not necessary. Wolves can be seen panting all the time with their long, broad tongues out in order to cool themselves up. In winters, wolves often spend their time bathing under the sun. Their coat and fat layer grows thicker. Since India does not have an extreme climate, the difference in summer coat and winter coat is not much. In winters, they find places like stacks of dry grass and rest on that to prevent heat loss. If cold winds blow, wolves curve their bodies to the inner side forming a loop with their back, connected to the fore limbs which they join with the hind limbs. They keep their sensitive noses in the middle of the loop and cover it with their bushy tails, they keep their backs towards the wind and the outer coat with hard hair prevents the cold winds from touching their skin. The inner coat keeps them insulated from cold. Wolves seem to enjoy rain, though some of them try to avoid it by taking shelter under tree shades or dens, but most of them spend time playing in the rain.

● Finding a territory

Wolves generally make their areas near some water

body, as water bodies attract more prey and also provide a moderate temperature, and there is never a scarcity of water which is most essential to sustain life. The areas generally include scrub forests, babool forests, grassland and bushy areas or desert lands. The Indian wolves prefer to live in semi-arid and dry environments and prefer openplain, scrublands and agricultural lands. The area of wolf packs in India stretches to about 200sq.km. The size of territory can vary depending on the size of the pack. Territories of two or more packs might overlap. They mark their territories by first sniffing and then scenting it. The scenting might be done either by urination or by rubbing the paws on the tree trunks, soil, stones etc as there are sweat glands present between the toes of the wolves. The sweat glands are also present on the sides of the neck, beneath the ears. Sometimes when we see a wolf rubbing its neck on the ground repeatedly, by twisting its body and then lifting up, it is leaving scent marks on the ground. Each wolf has a different characteristic odour. Wolves have a pineal gland secretion on the inner side of their tails at the beginning of the tail and they rub it on the ground to leave scent marks. Although all the pack members do this but only after the alpha male has marked the area already and also the alpha keeps leaving the scent every now and then in order to keep the intensity of his scent the highest.

The pineal secretion also suggests the availability of a mate as it tells whether a wolf is ready to mate and lone wolves are often seen to be rubbing tails on tree barks in order to attract a mate.

HUNTING BEHAVIOR

The normal prey for wolves include small rodents, rabbits, birds who usually stay close to ground and sometimes reptiles; though their food menu can extend to deer species and animals of same size. The Indian wolves usually hunt in pair, as the packs are generally small and most of the members other than alpha pair are not skilled hunters. Their strategy suggests that one of them tries to trick the prey by gaining its attention and playing as a decoy while the other one attacks from behind. This strategy does not involve much chase as wolves can follow their prey to long distances without getting noticed and attack all of a sudden with this strategy. At times, when they hunt in bigger packs, having members attacking from different directions, they push the prey to a point of no return. Built primarily for long-distance hunting, a wolf typically maintains a speed of about 5 miles per hour — this moderate pace allows him to travel many miles in a single day while looking for food. Shorter bursts of high-speed running allow him to quickly close in on prey, but he can't maintain his maximum speed for long. He can run about 25 miles per hour for up to 2 miles. For shorter distances, he can run as fast as 40 miles per hour — his top speed. As seen in Blackbuck National Park, they rely on their

stamina to exhaust the preys like antelopes and push it to the stony area with more ravines and ditches where more wolves wait in the ambush. Once the prey is surrounded, the wolves catch it from the snout in order to asphyxiate the prey; meanwhile another wolf hangs holding the neck of the prey and others jump from behind to bring the prey down to knees. Sometimes wolves also use the curious nature of the antelopes to fool them to fall into the network. The hunt is led by alpha male who selects the prey and forms strategy. Wolves may sometimes hunt just for fun and not to satisfy their hunger but this kind of hunt is related only to the small animals like toads, squirrels, moles, etc. These are included in their games which also keep them fit for a real hunt and chase. Wolves are excellent killers and they hunt during night. Wolves have also been seen to hide their solo-hunted small prey somewhere in the stem sockets of trees, bury them under stones, or hide them in thickets; and eat it when there is scarcity of prey or the wolf is too hungry and not getting a prey. Wolves are opportunistic creatures, and they don't let the easiest chance of a kill to slip from hands. Wolves generally target the weakest or old and sick member of a herd and try to separate it from the herd by creating a chaos in the herd. In this manner, wolves keep the theory of 'survival of the fittest' into action. They eliminate the weakest animals or those animals that have some disease and in this manner prevent certain diseases from spreading in the herd.

● Concept of a wolf-community turning into man-eater or livestock hunter

The opportunistic nature of wolves bring them closure to the much easier prey - the livestock viz. cows, buffaloes, calves, goat and sheep reared by the humans. Not being as swift as wild herbivores, the cattle and sheep often become easy targets, and at night when they are tied outside the houses, they cannot run. This is simplest kill for a wolf. The wolf first holds the mouth which doesn't let the animal make any noise, and then, two wolves together can easily take away the animal without letting anyone know. Livestock and cattle bring them closer to an even easier prey, the humans. Wolves are very quiet and sly hunters, and cases have been reported from Pratapgarh and Jaunpur districts of Uttar Pradesh where wolves started taking away small children right from their beds. In these districts, wolves had killed more than 40 people within six months in the decade of 1990-2000. Old people from these locations tell stories of wolves from their childhood and young times, and claim that wolves used to kill people on fields, babies, young children and cattle, very often. This led to a very severe case of human-wolf conflict, resulting in killing of wolves by means of guns, poisoning the flesh, setting traps, etc. Mob-lathicharge have also been seen where people surrounded wolves and killed them by beating them

with long sticks. People in Pratapgarh district have claimed to be setting the dens on fire or filling up the dens by mud and throwing petrol and fire logs inside the dens on pups. Wolves when about two years of age often leave the pack in search of a mate and such wolves are called 'lone-wolf'. On finding a suitable mate, which is also a lone-wolf, they mate and reproduce and building their own pack. Wolves being animals of high intellect and grasping power often learn and teach each other whatever different things they know. Wolves would try to imitate each other in their learning process. They also teach their pups whatever they know and pups carry the same knowledge to their adulthood. If an adult wolf is a man eater or a livestock hunter, its mate will also follow the same, knowing that man or cattle and sheep is an easy target. If both become human-dependent together, the problem is still the same. They will teach the other pack members, the same thing. The pups will also learn from their parents that choosing a human, goat and sheep as a prey is much better than wasting energy on a deer. Thus, if we assume a pack who becomes man-eater or livestock hunter, the pups of that pack, on their growing up and leaving the pack, will spread the same man-eating tendency to many other wolves. While pairing with other lone-wolf, they will share the same knowledge of easy prey with it; and subsequently this pair will teach the same thing to their pups. This process goes on repeating generation after generation. Besides, there is another possibility, as well. Packs are often considerate towards some old wolf or a lone-wolf who needs a pack protection for itself. If the new comer is a livestock hunter, within no time it will teach the other members too about the easy prey. This sharing of knowledge will eventually lead to an entire community of wolves, at a particular location, to turn into man-eater or livestock hunter.

FAMILY BONDS OF WOLVES

Wolf packs generally do not engage into fights as within few years the entire community of wolves, at a given location, includes mutual members from all packs due to the wolves leaving and forming new packs or packs sheltering a new comer. Wolves remember their family relations very well and often do not tend to harm each other. Although minor quarrels and disputes among wolves is common. In a family of wolves, all the members are closely connected to each other and have a high sense of protection, sharing and care for each other. The injured ones and old ones, who cannot hunt, are provided a share from the meal of other wolves. The pups and weak members, old wolves and injured, are provided with special treatment by others; and wolves try to carry out well with each member, not letting anyone suffer. In very extreme cases, if a wolf is suffering from a communicable disease or an injury that cannot be healed and might lead to its death in near future, the pack leaves that wolf to be

on its own, as wolves think about the entire pack in a broader perspective and do not run after lifting one member by putting entire pack at stake. Wolves mourn on the death of a pack member and they show their sympathy and tribute by skipping meals, stopping any play, deep tensed howls often at a regular repetition where one wolf at a time howls to show condolence.

● Relations with other species

Wolves are seen to be helping other species too by letting them to stay with their pack and utilizing their abilities for their benefit. This builds a symbiotic relationship between the two species. At times they let species like hyenas, foxes, monkeys, dholes, etc to stay with them. They use each other at the time of hunt, for protection and minor helps like finding water etc.. Just like dogs, who are apparently the man's best friend and the descendants of wolves, the wolves also eat grass or plant leaves to maintain any absurdness in their digestion. Also they may eat certain fruits, but rarely, to meet certain nutrition requirements or at time of scarcity of prey, although fruits or any herb is never a regular component of a wolf's diet because wolves are carnivores. Monkeys help the wolves in this case by dropping fruits from the trees. Not only this, monkeys also alarm them off any danger like arrival of a tiger, lion, leopard, etc., because in India, the wolves particularly in west, deal with nearly all three of these big-cats in the routine life. Though their affection to humans is a rarest of rare phenomenon, but it has manifested on some exceptional occasions. One case of wolves sheltering a human baby has come to light from the forests of Sultanpur district, Uttar Pradesh. The boy was named Ramu, who was found in a company of wolves. One can determine the high intellect and emotional side of wolves from this.

COMMUNICATION IN WOLVES

To interact with each other, wolves use a number of signs which include, whines, growls and barks, same as dogs do. Indian wolves are less frequently seen howling. Howling is of different types and this may range as territorial howl, howl to gather the pack, commencement of a kill, mourning howl, etc.. Body postures and tail movements play a significant role in determining the mood of the wolf. Down-pressed fore-shoulders and raised hips and a wagging tail is a sign of joy whereas pressed fore-shoulders, an erect posture with tail straight is a sign of alertness or exhibition of dominance. Teeth out, snout stretched back into folds, ears pointing back, fore-limbs folded with hind limbs steady and slow movement of tail in circles is a sign of anger or attack. There are numerous emotions, gestures and communication signs in wolves and it is pretty difficult to understand the communication of wolves at once. Wolves show a submissive posture by lying on their back

and raising all four limbs into air, squeaking. Also their games may include several emotions all compiled into each other. Jumping on to each other, rubbing each other, biting each other on snout, smelling, licking, patting each other with fore-paws are all means of showing love to each other in wolves.

DISCUSSION

Wolves have been a part of people's life especially in rural areas and it is necessary to get along with them. Wolves are the top predators in India after tigers, lions and leopards. They help to keep the food chain in order and maintain it by controlling the population of small herbivores and antelopes. It is on the carcass of their kills, that the smaller carnivores such as jackal, monitor lizards, foxes, hyenas etc. feed. At some locations, especially the forest or scrub areas near villages, where there are no other large carnivores' present, wolves are the only carnivores to maintain the major herbivores population. It is interesting to know that, even when a pack starts killing livestock and cattle, they only target the ill sheep or cow from the herd or a diseased animal. In this way, they actually prevent the entire herd from inheriting the same disease. The rearer of the cattle might fail to recognize the ill animal but wolves never fail due to their hunting instincts. Wolves are found near rural areas, for the probably reasons of - availability of barren lands that take up the shape of scrubs or babool forests near villages, the presence of canals meant for irrigation, the presence of crops like sugarcane, Arher, Sarso, etc.; and if the pack has found the cattle or human as easy prey, then this too might contribute to residing of wolves near villages.

CONCLUSION

Wolves have been identified as a schedule-1 species in the Wildlife Protection Act-1972 and are a subject of major concern. Records of certain locations that were taken to initiate the conservation plans for wolves (like the Blackbuck National Park), say that the population is rising gradually but at other places, especially those which are not covered in reserved areas or protected areas, the number is still going down. Government is seeking for better corridors and habitats for wolves. Efforts to avoid human wolf conflict are strongly needed from the side of farmers and people of rural sector. Such efforts may include- not killing the wolves at first place, putting electric fences with low voltage around the field, not letting children escape to suspected areas of wolves living, not letting their cattle to graze in forest areas, setting free the guard dogs, and also monitoring the fields regularly with utensils, sirens, hooters or bells making noises to scare away the wolves. It is the prime need of the hour to conserve the magnificent and majestic creature – **The Wolf**.

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- Jim Dutcher and Jamie Dutcher - The Hidden Life of Wolves - National Geographic - Feb 05, 2013

Vivek Menon - Indian Mammals a field guide - Hachette India Local - May 15, 2014

Besides Self-Observation, the books mentioned above were also concerned.

Abstracts of Some Relevant Research Papers

The Behaviour of Indian Gray Wolf (*Canis lupus pallipes*) in Captivity at Sakkarbaug Zoo Junagadh, Gujarat, India

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The present study was carried out on the behaviour of Indian grey wolf (*Canis lupus pallipes*) in captivity at Sakkarbaug Zoo, Junagadh, Gujarat, India. The Indian gray wolf is critically endangered species and falls into schedule-1. Total of ten wolves of 3-4 years old were observed. Ninety minutes observation was taken every week at morning time. Walking, resting, facial, resting alert, playing, fighting, standing, eating, etc. behaviours were studied. The observations of various behaviour activities of wolves we rerecorded from July 2018 to January 2019. Two different types of behaviours like active behaviour and inactive behaviours observed with two different patterns as 1) Wolf was solo in captivity and 2) Wolf pack in captivity. The time slice method was used. The wolves' activity was registered in each ten minutes, nine times in one and half hour at morning. Twelve types of behavioural activities were recorded in the captive wolves. They were displaying different types of activities. Peaceful sharing of food with one another without competition was found in wolves. The newly born pups and mother were kept in separate cage from other captive wolves' cage for their better survival and growth. When wolf kept solo, it shows monotonous behavior of running and walking as compared to wolves in the pack. This indicates that animal could be under stress.

Distribution, Status and Conservation of Indian Gray Wolf (*Canis lupus pallipes*) in Karnataka, India

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The Indian gray wolf *Canis lupus pallipes* is the major large carnivore in the plains of Karnataka, India. We carried out a study on its distribution and status from November

2001 to July 2004. We estimated 555 wolves occupying about 123 330 km² of the state. In the past 40 years, wolves have disappeared from the southern plateau from an area of about 31 801 km². Their distribution is now largely restricted to the north-eastern dry plains. The wolf has also disappeared in recent years from some 'protected areas' such as Melkote Temple Wildlife Sanctuary, and their present population is largely found in 'non-protected' areas. Blackbucks are the only natural prey of wolves in Karnataka, but their density in most parts of the state is extremely low. The major prey species is domestic livestock, especially sheep. The available 'remote area' (forests or rocky terrains) in the wolf-occupied regions determined the status of the wolf. Killing of adult wolves and pups was common throughout the range of the wolf. However, such killings were made largely by local shepherders with small sheep holdings and not by nomadic shepherds who maintained large sheep herds. The forests in the north-eastern parts of the state exist in small patches every few kilometers. Because each wolf pack ranges over large distances and is by and large a commensal species, we propose that the management of these small forest patches, considering them as components of a larger landscape, is the only effective conservation practice for the wolf. Although existing locally in low densities, because of a large ranging area of a single pack, the seemingly isolated wolf packs can become parts of a large meta population, providing a sustainable population.

First Photographic Record of Indian Wolf *Canis lupus pallipes* in Valmiki Tiger Reserve, Bihar, India

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Abstract The Indian wolf (*Canis lupus pallipes*) is an endangered species and known to be distributed in the vast areas of the Indian subcontinent. Intensive annual camera trapping surveys started in Valmiki Tiger

Reserve in 2013. The objective of these surveys was to monitor tigers and co-predators. The study area was systematically sampled by deploying a set of two camera traps per location within a 2 km² grid. The camera trap sites were determined by extensive search through sign surveys to find the ideal locations along animal trails, dirt tracks, and dry stream beds. Every year, camera traps were placed on average at 425 locations spread across 901 km². An Indian wolf was captured only once since 2013 at two different locations in the 2016-17 survey. This is the first photographic evidence of Indian wolf from Valmiki Tiger Reserve, Bihar, and might be an extension of the known eastern distribution range of the Indian wolf population from the Chhotanagpur plateau in Jharkhand and part of the lower Gangetic plains.

Environmental and Social Factors Influencing Wolf (*Canis lupus*) Howling Behavior

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Animals communicate in a variety of ways and calls are used for a number of important behaviors. Temperature, wind, time of day, and human activities can affect animals' use of calls, particularly over long distances. Effects of group size on the use of calls can be particularly influential in territorial social carnivores. Where gray wolves (*Canis lupus*) are hunted by humans, for example, howling may make it easier for hunters to locate individuals and ultimately increase mortality. We hypothesized that a suite of factors would affect wolves' responses to simulated howling. Specifically, we predicted that howling behavior would increase with (a) group size, (b) pup age, and (c) during crepuscular time periods and howling behavior would decrease (a) where wolves were harvested and (b) when it was hot or windy. Contrary to our prediction, larger groups did not respond as quickly to simulated wolf howls as smaller groups did and minimum and maximum daily temperatures were not good predictors of wolf howling response rates. Individuals in small litters of pups may have responded more quickly to howls than those in large litters because they are eager to seek safety from and have socialization with adults returning from foraging bouts. Although harvest did not appear to affect

vocal communication by wolves, group size, pup age, time of day, wind, and number of howls emitted greatly affected wolves' behavior and responses during howling surveys. Howling responses did not change because of harvest; response rates from wolves were nearly identical with (2.2%) and without (2.3%) harvest. The year-round benefits of long-distance vocal communication may outweigh the costs of increased mortality arising from howling during harvest season.

Characterising the Harmonic Vocal Repertoire of the Indian Wolf (*Canis lupus pallipes*)

Sougata Sadhukhan, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft,¹ **Lauren Hennelly**, Writing – review & editing,² and **Bilal Habib**, Conceptualization, Funding acquisition, Investigation, Project administration, Resources, Supervision, Writing – review & editing^{1*}

Vocal communication in social animals plays a crucial role in mate choice, maintaining social structure, and foraging strategy. The Indian grey wolf, among the least studied subspecies, is a social carnivore that lives in groups called packs and has many types of vocal communication. In this study, we characterise harmonic vocalisation types of the Indian wolf using howl survey responses and opportunistic recordings from captive and nine packs (each pack contains 2–9 individuals) of free-ranging Indian wolves. Using principal component analysis, hierarchical clustering, and discriminant function analysis, we found four distinct vocalisations using 270 recorded vocalisations (Average Silhouette width $Si = 0.598$) which include howls and howl-barks ($N = 238$), whimper ($N = 2$), social squeak ($N = 28$), and whine ($N = 2$). Although having a smaller body size compared to other wolf subspecies, Indian wolf howls have an average mean fundamental frequency of 422 Hz (± 126), which is similar to other wolf subspecies. The whimper showed the highest frequency modulation (37.296 ± 4.601) and the highest mean fundamental frequency (1708 ± 524 Hz) compared to other call types. Less information is available on the third vocalisation type, i.e. 'Social squeak' or 'talking' (Mean fundamental frequency = 461 ± 83 Hz), which is highly variable (coefficient of frequency variation = 18.778 ± 3.587). Lastly, we identified the whine, which had a mean fundamental frequency of 906 Hz (± 242) and is similar to the Italian wolf (979 ± 109 Hz). Our study's characterisation of the Indian wolf's harmonic vocal repertoire provides a first step in understanding the function and contextual use of vocalisations in this social mammal.

Save the Frogs Day: 25th April 2021

ENVIS-RP Institute of Wildlife Sciences, ONGC Building, University of Lucknow in collaboration with Uttar Pradesh State Biodiversity Board is continuously celebrating Save the frog's day from 2011 and this year also celebrated, Save the Frogs Day on 25th April 2021. This day is celebrated every year on the last Saturday of April. First, founded by Ecologist Dr. Kerry Kriger in May 2008. Save the Frogs Day was first time Celebrated in 2009, on last Saturday of April. It is the world's largest day of amphibian education and conservation action.



ENVIS-RP, Institute of Wildlife Sciences, Biodiversity & Wildlife Conservation Lab, Department of Zoology, University of Lucknow in collaboration with Uttar Pradesh State Biodiversity Board, Centre for Biodiversity, Research and Conservation, Lucknow is celebrating save the frog's day since from 2011. Due to pandemic this year we are organizing the online competition on Save the Frogs Day and got successfully result of competition. These online Competitions are different types of program which are as follow:

- ❖ Slogan on frog conservation
- ❖ Poster on frogs in pond
- ❖ Collage on Diversity of frogs in India



International Day for Biological Diversity 2021

On the occasion of International Biological Diversity Day ENVIS-RP, IWS, University of Lucknow in collaboration with Uttar Pradesh State Biodiversity Board organized an event of Poster competition, Collage competition, Slogan writing competition and Essay writing competition in Hindi and English both languages among school and colleges. Winners of these competitions were felicitated by cash prizes and e-certificates.

22 MAY 2021 BIODIVERSITY DAY

We're part of the Solution #ForNature

**Celebration of International Day for Biological Diversity-2021
(22nd May 2021)**

Theme: We're part of the Solution # For Nature

Uttar Pradesh State Biodiversity Board in association with ENVIS-RP, IWS University of Lucknow, Lucknow is organizing various online competitions on the occasion of International Day for Biological Diversity-2021

Online Competitions

- Essay writing Competition on "Our Role in Biodiversity Conservation"
- Poster making Competition on "Sacred Groves"
- Collage Competition on "Heritage Biodiversity"
- Slogan writing Competition on "Biodiversity Conservation"

Participate and win a certificate with following Prizes				
Sr. No.	Category	First Prize (Rs.)	Second Prize (Rs.)	Third Prize (Rs.)
1.	Students, Class 4 th to 8 th	3000	2000	1000
2.	Students, Class 9 th to 12 th	3000	2000	1000
3.	Students, UG & PG/ General Public	3000	2000	1000

Prizes for Hindi and English languages Essays will be separate.
 Entries to be submitted in electronic format latest by 21.05.2021, 5:00 pm on email address: envishel@rediffmail.com
 For any query kindly contact us: 9415030061, 9026987174



An International e Symposium on International Day for Biological Diversity on theme We're part of the Solution # For Nature 22-23 May 2021 - On this occasion Dr. Manoj Kumar Patariya (Chief Guest) Adviser & Scientist 'G' Science & Engineering Research Council (SERC), Department of Science & Technology (DST), Govt. of India, New Delhi attended and inaugurate the international e-symposia organized on the occasion of International Day of Biological Diversity via e-conferencing at the University of Lucknow and delivered his inaugural lecture. Chief guest also released the Green Audit Report of University of Lucknow and abstract

book of conference. He welcomed all the speakers of the symposia and wished everyone the best. In the end, called out to the researchers present in the event to think how we as a University, as a city and as the public contribute to a greener city and maybe work towards achieving that, and measuring what changes have happened due to these efforts in the next year.



Vaccination Camp-2021

ENVIS-RP, Institute of Wildlife Sciences, ONGC- Centre for Advanced Studies & Biodiversity and Wildlife Conservation lab, Department of Zoology, University of Lucknow organized a COVID 19 vaccination camp for 45+ Covid Sheild Second Doze on 21st May 2021 at Uma Hari Shankar Awasthi Hall and Malviya Hall from 10.30 a.m. onwards. To clear misconceptions and doubts of general public a Vaccine Varta- Webinar on "COVID Vaccination for 18 + and Post Vaccination Precautions" on 07th May 2021 jointly organized by ENVIS-RP, Institute of Wildlife Sciences, University of Lucknow, Unicef and World Health Organization (WHO).



Say no to Plastic Campaign- 22 June 2021

The central government going to lunch an awareness campaign on Single Use Plastic 2021 on 8 June 2021 i.e. World Ocean Day. The Hon'ble Prime Minister gave clarion call to phase out SINGLE USE PLASTIC (SUP) by 2022. The Ministry of Environment, Forest and Climate Change had notified Plastic Waste Management Rules, 2016, for handling plastic waste in an environmentally sound manner. Further, the Ministry has issued a draft notification on 11th March 2021 for amending the Plastic Waste Management Rules, 2016, with respect to prohibiting identified SUP items following a phase out schedule in 2022.



World Environment Day - 5 June, 2021

On the occasion of World Environment Day ENVIS-RP, IWS, University of Lucknow organized an event of tying of friendship bands to the Trees in the gardens. Students and Employees of university of Lucknow tied friendship bands to trees like Mango, Kadamb, Bel, Harshringar, Kachnar, etc.. It was to create an awareness campaign among the masses regarding tree conservation. various competitions like Collage and Posters has also been organized online. General masses have also send their selfie with trees holding friendship bands. The masses have also shared their selfie with trees on various social sites like Facebook, Instagram, Twitter, whatsapp, etc.. Best selfie was felicitated by University of Lucknow. On this occasion of World Environment Day plantation of Tirthankar Vatika was done at Chandra Shekhar Azad Girls Hostel. In which plantation of Kewali trees was planted.



ENVIS-RP Query Form

1. Name :
2. Designation:
3. Organization and Address:
4. E-mail:
5. Literature will be used for:
6. Date:
7. Signature:

I would like to search your database in the following areas: (tick appropriate subjects)

SUBJECT

Biodiversity	Traditional Knowledge
Wildlife	Conservation Biology
Landscape Ecology	Environmental Management
Biodiversity laws and legislation	Biodiversity Management
Threats to Biodiversity and Wildlife	Economic Importance of Traditional Biodiversity
Biodiversity and Wildlife Management	Remote Sensing and GIS
Biodiversity Impact Assessment	Socioeconomic Biodiversity
Role of Traditional Biodiversity in Conservation	

Call for Papers

The ENVIS-RP, Institute of Wildlife Sciences, ONGC Centre for Advanced Studies, University of Lucknow is designated ENVIS-Resource Partner for "Biodiversity and Traditional Knowledge issues". Our Quarterly Newsletter "Wuthering Wild" is dedicated to publishing papers on the above. The newsletter is widely circulated at the State, National and International levels.

We are seeking papers for our forthcoming issues and invite contributions in the context of state of Biodiversity and Traditional Knowledge of Uttar Pradesh including Biodiversity assessment, Biodiversity index, Environmental factors and Biodiversity, Biodiversity and Ecotourism, Traditional Flora and Fauna, Importance of Traditional Biodiversity, Utility of Traditional Knowledge in Human Welfare, Economic Assessment of Traditional Biodiversity, Biodiversity Legislation and Laws and Regulatory Systems, Biodiversity and Wildlife Education, Awareness & Participation Issues.

The papers in English should Generally contain between 2,500 and 3,000 words and may include charts, tables, diagrams, illustrations or photos of high resolution.

Publication of Papers will be subject to acceptance by the Editor.

Please send hard copies and one soft copy of the manuscript (A4 size, 12 font size, double spaced) to the editor "Wuthering Wild" at Coordinator, ENVIS-RP, Institute of Wildlife Sciences, ONGC Centre for Advanced Studies, University of Lucknow, Lucknow-226007, Uttar Pradesh or email at envisiwlulko@gmail.com or kanaujia.amita@gmail.com and indicate "Papers for Newsletter Wuthering Wild" in subject line.

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We would appreciate if you send your comments and suggestions to
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ONGC Centre for Advanced Studies
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Email: envisiwlulko@gmail.com

Disclaimer: The information in this Newsletter has been compiled from various sources and does not necessarily depict the views of the ENVIS-RP, Institute of Wildlife Sciences, University of Lucknow, Uttar Pradesh.