NEWSLETTER
LANDSCAPE NEWS

WILDLIFE RESEARCH AND CONSERVATION AWARENESS CENTRE

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FROM THE DESK OF VICE-CHANCELLOR

I am pleased to announce publication of first newsletter from Wildlife Research and Conservation Awareness Centre (WRCAC), Jai Narain Vyas University, Jodhpur. I am extremely hopeful that, this newsletter will promote scientific temper, research and creativity among the university students. This newsletter will also create awareness, encouragement and nurture feeling towards the biodiversity among university students as well as in the commoners.

Taking the first step is often difficult. I am highly optimistic that this newsletter will create a glorious chapter and will reach global standards in the field of conservation. This newsletter aims to generate and publish ideas that will benefit society and inspire people to work in the field of wildlife where they will be valued for their knowledge. At last I extend my cordial gratitude and thanks to the WRCAC team for their effort and time in publication of this quarterly newsletter.



Prof. K.L. Shrivastava
Vice-Chancellor, JNVU

ON THE BIRTH ANNIVERSARY OF Mr. Y D SINGH SANKHALA, LETS GET TO KNOW THE MAN BETTER

WILDLIFE CONSERVATIONIST OF SUNCITY

Y.D. Singh was a renowned conservationist, philanthropist, and environmentalist born to his father K.R. Sankhala and Smt. Sataywati on June 15, 1927 in Jodhpur. His elder brother was also a renowned conservationist Padamshri Kailash Sankhla, the founder-director of the tiger project of India. As a part of growing up, in 1945. YD Singh joined State Army (Jodhpur Sardar Infantry) and after eight years, in 1953, he opted for Voluntary Discharge from State Army to join Rajasthan State Services. He has always worked for the betterment of society. Due to his philanthropic work, in the years 1960-61 for Famine Relief Rajasthan Govt. appreciated exemplary work with a certificate and cash award in 1961. He also reinvented the traditional water conservation method and taught proper utilization of drinking water for Jodhpur in 1993. For his exemplary work, Maharaja Sahab Jodhpur rewarded him with the Palki-Saro Paw award in 1993. In 1997, he was nominated by Rajasthan Govt., for the honorary title of VanyaJeev Pratipalak. He was also a nominated Member of Abu Parbat Forest and Environment Development Samiti. Maharaja Sahab of Jodhpur was highly impressed by his work for the all-round development *viz.* tourism, wildlife, forest and environment, and water of Jodhpur and awarded him with the title of "MarwarRatan 2002". In 2002, he was recognized by Govt. of Rajasthan for his wildlife conservation work and efforts and nominated as a member of the Rajasthan state committee to promote forest management through a Public-Private joint venture.





In 2003, for conservation, protection of environment & natural resources he was awarded the INTACH (Indian National Trust For Art and Cultural Heritage) National Level environment (Anirudh Bhargawa) Award, 2003. He was also a Nominated Member of the Rajasthan State wildlife advisory board, Member of W.W.F (World Wildlife Fund), Jodhpur, and Secretary of Desert Wild Life Conservation Society (Godawan). He was also the founder and President of the alumni association of Shri Sumer Higher Secondary School, Jodhpur, President of Forest & Environment Society and President of People for Animal, Jodhpur

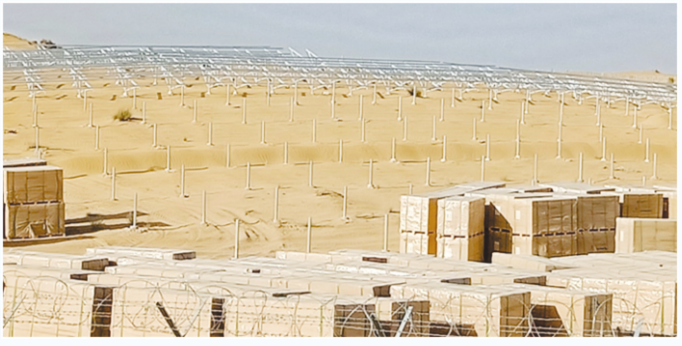
Environmental audit of the Renewable Energy Resources in the Great Indian Thar Desert needs immediate attention

Renewable energy production is increasing, with solar energy reported to be one of the most sustainable energy sources with resource potential across the world. In last 4-5 years the numbers of solar plants are increasing drastically in Jodhpur, Bikaner, Jaisalmer and Barmer districts in the Thar Desert. Solar plants vary in size and design and are formed by a metal frame that is driven into the ground to hold the panels up at a fixed angle. They have been deployed in large areas across the world, in a range of ecosystems from deserts to grasslands. Rajasthan supports a variety of habitats and wildlife that have not been surveyed extensively following robust and reproducible methods. Such assessments are vital for monitoring wildlife trends, particularly because this region is undergoing large-scale land-use changes whose effects on local wildlife are not comprehensively documented. This is particularly important for the Thar Desert region, given the expansions of its large rural population and developing economy into remote wildlife habitats vis-à-vis its general cultural tolerance towards wildlife and low intensity of land use factors that are compatible for species' persistence. Recent research addressed the temporal magnitude of microclimate and its effect on the floral and faunal diversity. Before establishing the solar park the ground need to be levelled and vegetation is cleared including trees and shrubs with the help of JCB and tractors. Despite the influence of microclimate on ecosystem processes with implications for ecosystem services, the Spatio-temporal effects of solar plants on common property resources, desert scrub forest and grassland's microclimate, are poorly understood. Species that breed in grasslands and agricultural areas, and those wintering in the Thar Desert are most affected. Changing land-use is the most important factor affecting avian fauna across breeding and non-breeding grounds. This leads to massive habitat destruction of the desert fauna, including threatened Great Indian Bustard, Chinkara, Desert cat, Desert fox, Varanus, Cobra, etc. These changes alter regulators of microclimate on the soil moisture, soil temperature, and air temperature. This further reduces the diversity of pollinators like honeybees, butterflies, mud wasps, etc. PV panels have been observed to alter the microclimate beneath them, decreasing the summer soil temperature by 2-3°C. near the plant relative to control areas nearby. In Bikaner distinct aloe till date solar plants established on about 50,000 Bigha of land after clearing ground, cutting trees and shrubs of native species like Khajadi, Rohida, Ker, Kumta, Ber, Jal, etc. This further reduced the breeding grounds, grazing grounds for the native faunal species and domestic animal. The microclimatic variability, the subsequent impacts on vegetation and GHG fluxes along with the present land use disturbance during and post-construction need to be monitored. Therefore the implementation of the environmental audit and EIA (Environment Impact assessment) need to conduct by the experts before allotting the land to the solar companies.

Anil Kumar Chhangani & Jatin Verma

Department of Environmental Science

Maharaja Ganga Singh University, Bikaner (Rajasthan)



The faunal heritage of Luni River Basin are at the Verge of extinction

The Luni river basin is located in south-western Rajasthan between latitude 23°4' and 27°5' N and longitudes 71°4' and 74°42' E. It is bounded by the arid western districts in the west, by Banas basin in the east, Shekhawati basin in the north and Sukli and west Banas basins in the south. The luni basin extends over parts of Ajmer, Barmer, Jalore, Jodhpur, Nagaur, Pali, Rajsamand, Sirohi and Udaipur districts of Rajasthan. It originates from the Naga Hills of the Aravalli Range in Ajmer district of Rajasthan. It flows through the Rajasthan districts Nagaur, Pali, Jodhpur, Barmer and Jalore covering a distance of around 495 kms and disappeared in the marshy land of Rann of Kutch in Gujarat state. The total catchment area of the Luni River Basin in Rajasthan is 37,363 km^2 which is second largest river basin of Rajasthan. The main tributaries of Luni are the Jawai, Sukri, Guhiya, Bandi and Jojari rivers. Jojari is its only right-bank tributary while its left bank has 10 tributaries. There are two Major Dam i.e. Sardar Samand and Jawai dam, nine medium and 344 minor irrigation projects along with few large reservoirs Jaswant Sagar Dam, Hemawas Dam, Dantiwada dam and Sipu dam situated on Luni River. The mean annual rainfall over the Luni basin is normally 320 mm of which nearly 95% falls between July and September. The water level two decades ago, before industries entered the Luni basin, was 15-40 meters below ground level (mbgl), which went up in 1997 up to 3-5mbgl, due to good rainy season (Bohra 2007). In the Luni river basin the drought years were 1958, 1961, 1963, 1964, 1967, 1968, 1969, 1971, 1972, 1974, 1977, and 1978 whereas flood years were 1979, 1986, 1987, 1988 and 1993 (Shankarnarayan & Amalkar 1994). A study of the literature for the period 1917-1980 revealed that there were 10-12 cases of heavy rainfall in the Luni basin (Vangani, 1978) and the 2006 flash floods in luni rivers at Barmer district caused water levels to rise as high as 15-25 feet submerging many parts along the river. A huge number of humans and animals died in the worst flood in Rajasthan. Yet another flood scar took place in year 2010 though casualties were less. The Luni River plays an important role for people and animal in the Thar Desert. This river system provides irrigation, drinking water, transportation, minerals and shelter for wildlife. Thus, the Luni river basin is a zoologist's paradise with diversity and populations of wild fauna but the Sand mining activities was noticed in the catchment area of Luni River, the bank of river handed to contractors for sand mining, which affected the desert wildlife. While compared with the situation even a few decades ago, the present status and population of wild animal in Thar region is drastically reduced and surviving wild fauna is fragmented and usually very small. Therefore, the habitat of Luni basin is going to be destruct by several factors which needs urgent attention of conservation

H S Gehlot, Prakash Suthar and Gaurav

Wildlife Conservation Lab, Department of Zoology

J N Vyas University, Jodhpur (Rajasthan)



Wolf
(Canis lupus pallipes)



Chinkara
(Gazelle bennetti)



Blackbuck
(Antilope cervicapra)



Wild Ass
(Equus hemionus khur)

Butterflies of Jodhpur, Rajasthan, India

Insect is the largest group of animal kingdom which comprise of more than half of earth's diversity of faunal species along with widest distribution pattern. At present about 80 per cent of the world's known animals are insects, and lepidopterans accounts for 112,000 species, which include both butterflies and moths. Lepidopteran members' butterflies are one of the best-known insects and shows diversified nature and they occur both as crop pests and pollinators. Jodhpur contains a very diverse flora and fauna and is rich in faunal diversity with its natural, cultural, historical, heritage values. This article deals with general review of some major butterfly fauna of Jodhpur from western part of Rajasthan. Field observations and collections were made during 2020-21 in varied habitats like parks, hilly areas, open fields and other conserved areas of Jodhpur having vegetation, soil, water resources etc. natural habitats for butterflies. The main families observed are Nymphalidae, Pieridae, Lycaenidae, Papiolinidae, Pyralidae, Geometridae, etc. The family Nymphalidae constituted with five species and family Pieridae with four species. The family Lycaenidae and Papiolinidae constituted with two species, Pieridae with five species, Pyralidae, Geometride, with one species was observed. Nymphalidae family was the richest, following Pieridae, Lycaenidae, Papiolinidae, Pyralidae, Geometride were recorded. Overall high lepidopteran diversity was observed in the Suncity. To ascertain the conservation priorities and strategies for butterfly species, the biocenotic research was done for better knowledge of faunistic structure and taxonomic position for many species in the Jodhpur, Rajasthan. However, some more species are likely to be added to the present list as the study is still in progress.

Dr. Abhishek Rajpurohit

Department of Zoology & Environmental Sciences,

Lachoo memorial College of Science & Technology,

Jodhpur (Rajasthan)

Order: Lepidoptera
Family - Pieridae
Anaphaeis aurota Fab.
Catopsila pomona Cramer
Eurema hecabe Linn.
Hebomoia glaucippe
Family - Pyralidae
Hymenia sp.
Family - Nymphalidae
Danaus chrysippus Linn.
Junonia almana javana
Junonia hierta
Junonia lemonias
Junonia orithya
Family - Geometride
Epirrita dilutata
Family - Lycaenidae
Lampides boeticus Linn.
Zizina sp.
Family - Papiolinidae
Pachliopta atrophaneura
Papilio demoleus



Clouded-Yellow
(Colias croceus)

Plain Tiger
(Danaus chrysippus)

Gram Blue
(Euchrysops cnejus)

Wetland of Rajasthan the Sambhar Salt Lake: Struggle to sustain

Saline lakes and playa are abundantly distributed in various parts of Thar Desert of Rajasthan, owning to high rate of evaporation and presence of endohreic basins; however the Sambhar salt lake holds a higher place among all, with its Ramsar site status. A Ramsar wetland is "Wetland of International Importance", identified by an International convention for its conservation, policy making, sustainable use, capacity building and technology transfer. Unique distinction and significant contribution in conserving biological diversity fetches this status for any wetland. Sambhar Salt Lake was awarded the Ramsar status, as the lake has immensely contributed to sustaining bio-diversity and supporting vulnerable, endangered, or critically endangered species and their life-stages in its particular biogeographical region. Thousands of flamingos and other migratory birds of North Asia and Siberia, visit Sambhar lake every year primarily for wintering and breeding. Sambhar Lake holds a valuable habitat status as it supports one of the largest flamingo populations in the subcontinent. Waterfowls along with phytoplankton, zooplankton and benthic invertebrates are reported to be the significant biotic components of this unique saline ecosystem. This saline stretch is the most important area for flamingos on the Indian Subcontinent, outside the Rann of Kachchh. It has a distinct ecology with specialized algae and microbes proliferating in high salinity and giving it striking colors alongside sustaining migrants. Till recent years the shrinking lake area, overexploitation of the lake bed for salt production and encroachment were considered to be the main threats to the lake's ecosystem and its existence. However the mass mortality of various avian fauna in year 2019, caused by *Clostridium botulinum* has emerged as new threat to the lake's bio-diversity. The lake sheltering many native and migrant avian fauna, suffered the biggest wildlife tragedy in Nov 2019 due to avian botulism outbreak. Affected birds showed clinical signs of dullness, depression, anorexia, flaccid paralysis in legs and wings, and neck falling to the ground. The birds were helpless and unable to walk, swim, or take flight. Their body temperature was normal and no nasal discharge was apparent. They had no signs of respiratory or any other distress. As the birds were paralyzed over wings and legs, with neck-drooping syndrome, they could not escape the predators and were left mutilated at many sites. The lake once one of the best places for bird survival had turned into a mass grave yard for the same creature. This outbreak affected all life stages of native and migratory birds alike, leading the death toll to 20,000. Despite being non-contagious, avian botulism caused mass mortality through bird-maggot-bird cycle or secondary intoxication. The tragedy brought to the fore the degrading and dismal lake structure. The disaster has also left a negative impact on the age old salt industries of this area. The *Clostridium botulinum* bacterium causing the disaster is an anaerobic, gram-positive, spore-forming rod shaped microbe commonly inhabiting soil, water, plant surface and the intestinal tracts of animals. The spores of *C. botulinum* are known to persist for very long periods in soils and aquatic sediments. This poses a risk for recurrence of the outbreak in coming times; threatening the bio-diversity. Despite its ecological and economical distinction the lake suffered apathy of authorities resulting in overexploitation and habitat degradation. It has not been declared a notified or protected area despite its Ramsar status. The mammoth task of lake conservation and habitat restoration requires the co-operation and co-ordination of both local residents and concerned authorities.

Dr. Archana Gaur

Assistant Professor, Govt College, Jodhpur



Flocks of Lesser Flamingo (*Phoeniconaias minor*)

Leopard on Prowl at Outside the Aravali Hills

Leopard (*Panthera pardus*;Synonym:*Felis pardus*), is charismatic but highly endangered animal, belongs to Order: Carnivora, Super-family: Feloidea, Family: Felidae of Class: Mammalia. It is an Iconic animal of biodiversity conservation in Rajasthan. Leopard is one of the most secretive, solitary and partially arboreal animal, but due to its dwindling population, it has been rightly placed under Schedule-I (Part-I, Mammals, S. No. 16-B) of Wildlife (Protection) Act, 1972. Present study pertains to (1) trend in the leopard population in Kumbhalgarh Wildlife Sanctuary (KWLS), situated in South-Eastern fringes of the Thar Desert, and (2) human leopard conflicts within and around the sanctuary, and in the western arid districts of Rajasthan, spread over 61% (1,96,150 sq km) of total geographical area of the state. Kumbhalgarh Wildlife Sanctuary among 10 wildlife reserves is spread over 578 sq. km area in Pali, Rajsamand and Udaipur districts of the state. It is located between 25° and 25°40'N, and between 73°02' and 73°30'E at an altitude of 500 to 1,300 above MSL. The sanctuary characterized by undulating hills and hillocks of Aravalli ranges, dominated by dry-deciduous vegetation, with a few scattered water bodies; predominate mammalian fauna of the sanctuary includes wolf, leopard, sloth bear, hyena, Sambhar, blue bull, Indian gazelle, four-horned antelope, hare, etc. The leopard is an apex animal in the food chain of the sanctuary. Its population within the area is highly fragmented. This sanctuary forms a typical eco-tone between hilly forests of Aravalli ranges and the Thar Desert, which is located in its north-west, and serves as a barrier to check eastward extension of the Great Indian Thar Desert. Once the hunting ground of Rajasthan's royals, this area was declared a wildlife sanctuary in 1971. According to recent wildlife census, total 391 leopards have been reported from all Protected Areas (in all totals 16, including 2 National Parks and 14 Wildlife Sanctuaries) of the state but highest numbers, i.e., 119 leopards have been recorded in Kumbhalgarh WLS. Similarly, in this sanctuary, 89 and 87 heads of leopard have been sighted in 2010 and 2014, respectively. There are 22 villages situated within the sanctuary, and 138 along the periphery. 14 cases of leopard conflicts have been reported in Jodhpur, Pali, Barmer, Bikaner, Beawar, Sirohi and Jalore districts during last 5 years. Out of these cases, 12 encounters were with male leopards. These animals were later caught by the state forest officials and trans-located to its natural habitats. Human activities and livestock grazing in and around inhabited villages caused shrinkage of natural habitat of the leopard. Under these circumstances leopards unable to find their preferred prey base in shrinking forests and made regular visits to human habitation to prey upon domestic animals and often encountered with the human being, especially, during summer and winter months. Where scores of leopards have been caught after they ventured into residential areas, some of them killed, others trapped, and a few were rescued from abandoned, dry wells. Human-leopard conflict is the major issue for the leopard conservation in western Rajasthan.

H S Gehlot, S S Rathore* and Tapan Adhikari

Wildlife Conservation Lab, Department of Zoology

J N Vyas University, Jodhpur (Rajasthan)

*GIB Breeding Centre WII Project, Dehradun



Leopard *(Panthera pardus or Felis pardus)*

STATE BIRD OF RAJASTHAN: GREAT INDIAN BUSTARD

The Great Indian Bustard or commonly known as Godawan, is the state bird of Rajasthan. It has a distinctive appearance with brown, grey, and black feathers on the back. A broad whitish neck, naked yellowish long legs, and black crown on its head have made the bird blend in the arid grasslands. Males are 15-18 Kgs and females can weigh between 9 to 12 kgs. The majority resides in the Sudasari and Khetoloi region of the Jaisalmer district of Rajasthan, this endemic bird is now critically endangered and needs anthropogenic support to flourish. Less than 150 remain in the wild, 16 birds had been artificially bred in the Sam breeding center. Earlier the hub of more than 600 GIB, this region is seeing a drastic declination in the number of the species owing to the various causes *viz.* Large windmill and solar farms, electrocution and high voltage power lines, urban sprawl, tourism pressure, encroachment in enclosures, overgrazing, change in land-use, increasing population of feral dogs, over-speeding and continuous expansion of roads, stone quarrying, habitat depletion, etc. Powerlines are the most critical cause that killed more than six GIB in the last five years. Despite the order from the Hon'ble Supreme Court of India, is not seen any progress in the process of undergrounding powerlines at least in the region of GIB's potential habitat.



GREAT INDIAN BUSTARD *(Ardeotis nigriceps)*

STATE ANIMAL OF RAJASTHAN: CHINKARA

The chinkara *(Gazelle bennetti)* is a slender graceful build animal. The dorsal and lateral coat colour is light chestnut, the colour deepening where it joins the white of the under parts on the flank and buttocks. There is the usual white streak down each side of the face, so characteristic of the gazelle, and a dusky patch above the nose. There is no colour difference between male and female. Both the sexes bear horns and the male has 'S' shaped, backwardly curved horns with 15 to 25 rings while the female has straight, thin, small and ring less horns. A full grown chinkara male measures about 55-65 cm, at the shoulder and weight about 25 kg. Chinkara are shy of man and not so frequently seen in cultivated fields but in Bishnoiyans areas it visits mostly to crops. When alarmed, a chinkara herd goes off at a wild pace, and then stops at about 200 or 275 m away to discover the cause of the alarm. Facilities of sight, smell and hearing are all equally developed in this animal. The chinkara is a more nocturnal animal than diurnal, feeding crop fields under the cover of night and then retreat at break of dawn to the remoter areas of the desert. Chinkara lives in small herds of 5 to 10 animals but majority of herds are comprised of 4 – 7 individuals. The adult males are found as solitary but single separated female is a rarity. It has a pre-orbital gland below each eye. Externally this gland appears like vertical hairless silt and its secretion is used for territory marking by territorial males.



CHINKARA *(Gazelle bennetti)*

WRCAC ACTIVITIES

Life on Earth depends on ecosystems. The Ecosystem Restoration aims to prevent, halt, and reverse ecosystem degradation on all continents and oceans. It has the potential to alleviate poverty, combat climate change, and avert mass extinction. It will only succeed if everyone contributes. The Jai Narain Vyas University, Jodhpur signed an MoU with the Indian Red Cross Society in February 2022 with the objective of ecosystem restoration and environmental management. On 7th June 2022, to motivate students on climate change and restoration; a plantation drive has been started in the Jai Narain Vyas University (New Campus). The drive has been widely accepted in the university and various units of *viz*. Wildlife Research and Conservation Awareness centre, National Service Scheme, National Cadet Corps, Bharat Scouts and Guides, and Guru Jambheshwar Research Centre had actively participated in the program. The Central Goods and Service Tax Department, Jodhpur, Government of India has supported this event and planted 101 trees on the campus. The increasing tree cover on the campus will help to replace the trees that have been destroyed by the termites and restore the campus environment. The increasing tree cover will also attract and develop habitat for varied fauna thus, stabilizing the environment of Jai Narain Vyas University (New Campus) and will develop a green space within the urban area of Jodhpur.



Ecosystem Restoration through Plantation at campus as per direction of Hon'ble Chancellor

ADVISORY COMMITTEE OF WILDLIFE RESEARCH & CONSERVATION AWARENESS CENTRE

S.No.	Name	Designation & Address
1	Dr S P Goyal	Emeritus Scientist, Wildlife Institute ofIndia, Dehradun, Uttrakhand
2	Prof G R Jakher	Ex-Vice Chancellor, MGS University Bikaner
3	Dr H C Bohra	Former Scientist, CAZRI Jodhpur
4	Prof G Tripathi	Ex-Professor & Head, Department of Zoology JNVU Jodhpur
5	Prof Praveen Gehlot	Professor, Department of Botany JNVU Jodhpur
6	Dr Randeep Singh	Assistant Professor, Amity Institute of Forestry and Wildlife, Amity University, Noida, Uttar Pradesh
7	Dr Vijay Kumar Koli	Assistant Professor, Department of Zoology MLSU Udaipur
8	Dr Shravan Singh Rathore	Manager & Sr veterinary doctor, GIB Breeding Centre WII project, Dehradun
9	Dr Vittlesh Vyas	Senior veterinary Officer, Animal Husbandry Dept. Govt of Rajasthan
10	Dr Daulal Bohra	Head, Zoology Department Seth G B Podar college Nawalgarh, Jhunjhunu

From Editor Desk

WRCAC is recently established centre at JNVU for conservation of Biodiversity. On the occasion of 95th birth anniversary of first ex situ conservationist of Great Indian Bustard in Thar Desert of Rajasthan, WRCAC is going to publish a quarterly Newsletter. Hope this newsletter will provide a platform for academician, wildlife researcher, Naturalist and commoners alike.



Dr. Hemsingh Gehlot
Director, WRCAC, JNVU

Published By:
Wildlife Research and Conservation Awareness Centre
JNV University, Jodhpur, (New Campus)
Email: wrcac@jnvu.edu.in Contact: 9413637961