PUDUCHERRY ENVIS HUB

(Environmental Information System)

Host Centre : Puducherry Pollution Control Committee
Supported by Ministry of Environment, Forest & Climate Change
Government of India, New Delhi

ODONATES OF OUSTERI FRESHWATER WETLAND, PUDUCHERRY, INDIA

Status of Environment & Related Issues in Puducherry

VOLUME XII-III

JULY - SEPT, 2021

Introduction

Dragonflies and damselflies are prominent and colourful insects in tropical landscapes. The order Odonata is one of the ancient groups of insects. Fossil evidences suggest that the beginning of this group dates back to the Permian about 250 million years. Dragonflies and damselflies most common insects found in forest, fields, meadows, wetlands, ponds and rivers (Borror et al. 1989; Mc Gavin, 2001; Silsby, 2001). Approximately 6,000 existing species are spread all over the globe. India is extremely diverse with more than 500 recognized species (Subramanian, 2005). The dragonflies and damselflies are amphibious spend a major portion of their life cycle in fresh water ecosystem (Andrew et al. 2009), the adults are terrestrial and the larvae are aquatic.

Odonates, being predators both at larval and adult stages, play a significant role in the wetland ecosystem. Adult odonates feed on mosquitoes, blackflies and other blood-sucking flies and act as an important biocontrol agent of these harmful insects. Dragonflies are excellent indicator species of freshwater quality. Adult dragonflies may also play an important role in controlling populations of insects and mosquitoes (Ellenrieder, 2003). Dragonflies are mostly abundant and common species but a few require very specific habitats as immature nymphs. The most significant threat to dragonfly species is habitat destruction, pollution of freshwater habitat by humans (Silsby, 2001). Many researchers (Mitra, 1995; Srivastava & Babu, 1997; Mishra, 2007) conducted work on checklist of odonates in different states but there was no study on checklist of odonates in Ousteri freshwater wetlands, hence preliminary checklist was prepared.

Study area

Ousteri fresh water wetland is located between 79° 44.22' E 11°56.85' N it spreads over 800 ha partly in Puducherry and partly in Tamil Nadu. The lake depends on its catchment for 75% of its water; the remainder comes from diversion channels from Veedur dam. The lake is an internationally significant site for migratory birds; the lake's most valuable function is for irrigation and ground water recharge. The lake holds a rich floral diversity of over 200 species of plants belonging to 60 families. It holds an extensive aquatic vegetation of the floating, submerged and emergent type. The Lake is declared as a bird sanctuary by the Government of Puducherry and it also placed as an Important Bird Area (Bird Life International, 2004). The study area experiences mean annual temperature of 30°C and mean annual rainfall around 1311-1172 mm. The average figure of annual rainy days is 55, the mean monthly temperature ranges from 21.3-30.2°C. The climate is tropical dissymmetric with the bulk of the rainfall during northeast monsoon October-December.

Methodology

Study was conducted during 2020-2021 in all three seasons viz., summer (March–May), monsoon (June-October), and winter (November–February) for a period of one year. Mostly direct searching method was used in the present study and photographs were taken using digital camera for identification.

Most of the Odonates were collected using insect net and released after identification. Only photographs were obtained in the case of some odonates which resisted capture. Collected odonates were identified with the help of standard books and journals of odonates (Subramanian, 2009).

Result and Discussion

The present work reveals the preliminary dragonfly and damselfly presence of 13 species of Odonates belonging to 3 families (Images 1 to 13). A detailed systematic species list is presented in Table 1. Maximum numbers of species were found in Libellulidae family (8) followed by Coenagrionidae (4) and Gomphidae (1). According to IUCN species category 11 species were categorised as least concern (LC) and one species Orthetrum Sabina were categorised as data deficient (NA).

Table 1: A preliminary checklist of Odonate species recorded in Ousteri Lake ecosystem, Puducherry

No	Species Name	Family	Common Name	IUCN Category
1	*Acisoma panorpoides*	Libellulidae	Trumpet-Tail	LC
2	*Uracis imbuta*	Libellulidae	Wood skimmer	LC
3	*Orthetrum pruinosum*	Libellulidae	Crimson-tailed marsh hawk	LC
4	*Brachythemis contaminata*	Libellulidae	Ditch jewel	LC
5	*Rhyothemis variegata*	Libellulidae	Variegated flutterer	LC
6	*Tholymis tillarga*	Libellulidae	Coral-tailed cloudwing	LC
7	*Orthetrum sabina*	Libellulidae	Green marsh hawk	NA
8	*Ictinogomphus rapax*	Gomphidae	Indian Common Clubtail	LC
9	*Diplacodes trivialis*	Libellulidae	Ground skimmer	LC
10	*Ischnura senegalensis*	Coenagrionidae	Common blue-tail	LC
11	*Agriocnemis pygmaea*	Coenagrionidae	Pygmy Dartlet	LC
12	*Ischnura aurora*	Coenagrionidae	Golden dartlet	LC
13	*Ceriagrion cerinorubellum*	Coenagrionidae	Orange-tailed marsh dart	LC

LC: Least concerned, NE: Not Applicable, DD: Data deficient

Among the 13 species Woodskimmer is a very common species in entirely the study field, passing off even in disturbed habitats, watersheds and riparian areas of the lake. This is an opportunistic species which breeds in ponds, ditches, marshes, open swamps and rice paddies. Since the species is extremely common there was no conservation measures were recommended (Sharma, 2010). The population of common blue tail may be threatened by one cause or another; it is unlikely that this species is globally threatened (Dow, 2013). There is a need for more distribution data, especially from India, but no specific conservation measures are likely to be needed for this species (Dow, 2013). The Rusty darner assessed as Data Deficient (DD) category, but additional information is required for confirmation. Much more information on distribution, population sizes, precise habitat requirements and tolerance to disturbance is needed for this species before any conservation measures that might be needed can be planned (Dow, 2013).

Species Description

1. *Acisoma panorpoides* (Rambur, 1842)

Morphology

It is a small dragonfly with blue eyes. Its thorax is azure-blue marbled with black to form a beautiful pattern on the dorsum and the sides. Abdomen is azure-blue, marked with black. Segments 1 to 5 have sutures finely and ventral borders more broadly black. There is a dorsal stripe which broadens at the jugal sutures and apical borders of segments. There is a speckled stripe on sub-dorsum of segments 1 to 4. There is a large ventro-lateral spot on each of segments 3 to 5. Segments 6 and 7 are black with a large spot of blue on each side. Segments 8 to 10 are entirely black. Anal appendages are bluish-white.

2. *Uracis imbuta* (Burmeister, 1839)

Morphology

This species are medium-sized dragonflies and grow to be 28 to 40 millimetres tall. The colour of the abdomen of coloured males is mostly bluish but with age it takes on the same bluish hue as the abdomen. The wings are transparent except for the brownish tinted wing tips. It can also happen that the wings have brown ribbons due to polymorphism. Like the Vertex, the post frons are black. There are also two tubercles on the vertex, which allow a distinction to Y-pirangathemis species.

3. *Orthetrum pruinosum* (Burmeister, 1839)

Morphology

Frons brown or blue black anteriorly; thorax reddish brown; wings hyaline, with a reddish brown basal marking at base of hind-wing; abdomen purple red in adults, vermilion red in sub adults; in female, frons yellowish brown; thorax reddish brown; abdomen, dull ochreous.

4. *Brachythemis contaminata* (Fabricius, 1793)

Morphology

Wings with reddish nervures and bright orange fascia extending from base to near pterostigma in forewing and hind-wing in male; in female, the bright orange fascia seen in the male absent, hind wing very palely tinted with yellow at extreme base.

5. *Rhyothemis variegata* (Linnaeus, 1763)

Morphology

In male, the whole of wings tinted yellow, fore-wings with spots at node, discoidal cell, apex and at middle of Riii; hind-wing with similar dark spots and two broad longitudinal basal bands; in female, fore-wing hyaline from node to apex, basal half with broad black markings, hind-wing with broad irregular markings to as far distal as pterostigma, apex hyaline.

6. *Tholymis tillarga* (Fabricius, 1798)

Morphology

It is a medium sized dragonfly with reddish eyes, yellowish red thorax and coral red abdomen. Its wings are transparent; but hind wings have a golden-brown patch in the base, bordered by a cloudy-white patch. Female is brown and lacks the cloudy-white patch in the hind-wings.

7. *Orthetrum sabina* (Drury, 1770)

Morphology

Abdomen enormously swollen dorso-ventrally as well as laterally from segment 1 to 3; thorax and abdomen greenish-yellow with black markings.

8. *Ictinogomphus rapax* (Rambur, 1842)

Morphology

Large yellow and black colored dragonfly with bluish-grey eyes. Its thorax is black, marked with yellow or greenish-yellow stripes. Its abdomen is also black with bright yellow marks. There is a leaf like expansion in both sides of segment.

9. *Diplacodes trivialis* (Rambur, 1842)

Morphology

Adults black marked with yellow or pruinosed blue, legs black in males, in sub adults, thorax and legs, greenish yellow with black markings, wings hyaline, cuii in hind-wing widely separated from posterior angle of discoidal cell; female similar with sub adult male; anal appendages creamy white.

10. *Ischnura senegalensis* (Rambur, 1842)

Morphology

Wings with pterostigma in fore-wing, oblique, diamond shaped, black, outer angle and costal border white, tinted with blue on upper surface of wings, pterostigma of hind-wings smaller than that of fore-wings, uniform pale brown framed in heavy black nervures, second abdominal segment metallic blue on dorsum, segments 3 to 7 citron-yellow at the sides, black on the dorsum, segment 8 azure blue, narrow black at base, 9 and 10 black on dorsum.

11. *Agriocnemis pygmaea* (Rambur, 1842)

Morphology

In male, labrum metallic blue, pterostigma pale yellow in forewings, black in hindwings; anal appendages brick red colour; female robust than male, labrum non-metallic; pterostigma pale yellow in both wings.

12. *Ischnura aurora* (Brauer, 1865)

Morphology

Wings with pterostigma kite-shaped, rose-red for its proximal half, hyaline for the distal in forewing, in hind-wing, much smaller than forewing, uniform pale grey, almost colourless, segments 1 to 6 of abdomen, citron-yellow, extreme base of segment 7 and 8 to 10 entirely azure blue on dorsum, segment 10 with a broad black spot and a bifid dorsal apical tubercle.

13. *Ceriagrion cerinorubellum* (Fabricius, 1798)

Morphology

In male, abdomen bright red at base and anal ends, black on dorsum in between; in female, abdomen similar to the male, but the end segments usually a duller brownish red.

CONCLUSION

A study conducted by Zoological Survey of India (2006) on dragonflies and damselflies diversity in all over in Puducherry U.T. recorded 15 species. Odonates are indicator species, This means that the existence of dragonflies and damselflies determines the health of an ecosystem, especially the water bodies. The present study is only a preliminary checklist of dragonflies and damselflies from Ousteri Bird Sanctuary and aims to take a perfect list of dragonflies and damselfly species in the whole of Ousteri freshwater ecosystem for conservation of Odonates.

REFERENCES:

1. Andrew, R. J., Subramaniam, K. A. and Tiple, A. D. (2009). A Handbook on Common Odonates of Central India. Published by South Asian Council of Odonatology. 65 pp.
2. Borror, D., Triplehorn, C., Johnson, N. (1989). An Introduction to the Study of Insects, 6th Edition. Orlando: Harcourt College Publishers.
3. Dow, R.A. (2013). Crocothemis servilia. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org>.
4. McGavin, G. (2001). Essential Entomology: An Order-by-Order Introduction. Oxford: Oxford University Press.
5. Mishra, S.K. (2007). Fauna of Madhaya Pradesh (Odonata: Insecta). State Fauna Series, Zoological Survey of India (Kolkata) 15(1) : 245–272.
6. Mitra, T.R. (1995). Insecta: Odonata including a new species from Central India, pp. 31–34. In: Fauna of Indravati Tiger Reserve. Fauna of Conservation Areas, Zoological Survey of India, 117pp.
7. Sharma, G. (2010). Anisogomphus occipitalis. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org>.
8. Silsby, J. (2001). Dragonflies of the World. Washington, DC: Smithsonian Institution Press.
9. Srivastava, V.K. & Babu, B.S. (1997). Annotations on the Damselfly collection from Sagar, Central India. Fraseria 4: 13–15.
10. Subramanian, K.A. (2005). Dragonflies and dams fly of peninsular India, A field guide.
11. Subramanian, K.A. (2009). A Checklist of Odonata (Insecta) of India, Zoological Survey of India Western Regional Station, Pune-411 044 Maharashtra, India.
12. Subramanian, K.A. (2009). A Checklist of Odonata of India. Zoological Survey of India, 36pp.
13. von Ellenrieder, N. (2003). Odonata (Dragonflies and Damselflies). Pp. 133-139 in A Evans, R Garrison, M Hutchins, eds. Grzimek's Animal Life Encyclopedia, Vol. 3, Second Edition. Detroit: Gale Group.

ACKNOWLEDGMENT:

Puducherry ENVIS Hub sincerely thank Dr. R. Alexandar, Independent Researcher, Puducherry for sharing the contents.

DISCLAIMER:

The views expressed by the authors belongs to them and do not necessarily reflect the views at the Puducherry ENVIS Hub or Puducherry Pollution Control Committee. The ENVIS Hub is no way responsible for any liability arising out of the contents of the chapters. Any discrepancy found may be brought to the notice of the Puducherry ENVIS Hub.

International Plastic Bag Free Day on 03.07.2021

Puppetry Video Released on 02.07.2021

On the occasion of International Plastic Bag Free Day, 2021, 4 Awareness Videos on 'Ill effects of Single Use Plastic' has been released on 02.07.2021 by the Hon'ble Chief Minister, Government of Puducherry in the presence of **Hon'ble Minister Mr. Lakshminarayanan, Smt. Smitha. R, I.A.S.,** Chairperson, Puducherry Pollution Control Committee (PPCC), **Dr. S. Dinesh Kannan, IFS,** MS-PPCC and other officials of PPCC, DST&E, ENVIS Puducherry Team. These videos emphasize the ill effects and alternative products of single use plastic.

Webinar on 'Not to Ban, but to Plan – Plastic'

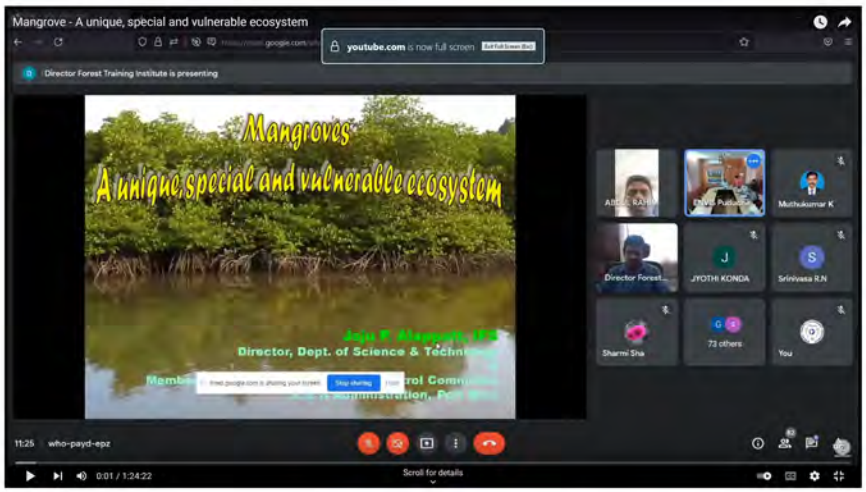
Dr. R. Vasudevan, Dean (ECA) & Professor (Dept. of Chemistry), Envis Coordinator, Thiagarajar College of Engineering, Madurai delivered expert lecture on "Not to Ban, but to Plan - Plastic" on the event of International Plastic Bag Free Day on 03.07.2021. He highlighted the creation of plastic, uses of plastic, properties of plastic, effects and ecological solution.

Turtle Sculpture from Plastic Waste

Puducherry ENVIS Hub, Puducherry Pollution Control Committee in association with Vannidhasan High School, Seliamedu, Puducherry, Terre Foundation and Eden beach Team created the Turtle Sculpture at Eden Beach, Chinnaveerampattinam, Puducherry using waste plastic materials obtained from the seashore. The turtle structure shows that the harm we do to life in the oceans with our plastic-consuming lifestyles and also to raise awareness about the damage done by plastic materials to marine life.

INTERNATIONAL DAY FOR THE CONSERVATION OF THE MANGROVE ECOSYSTEM ON 26.07.2021

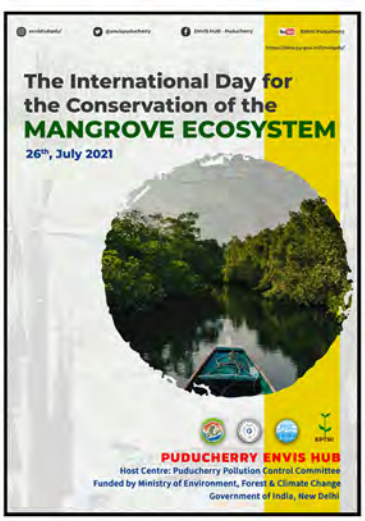
WEBINAR

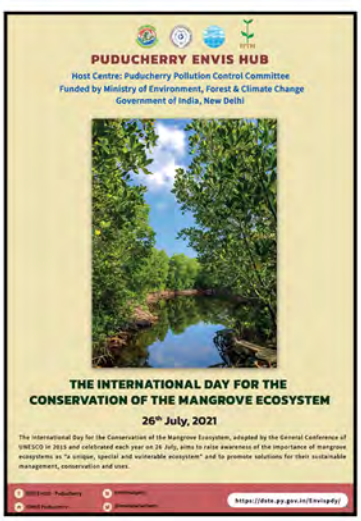


Shri. Joju P. Alapatt (National Award Winner for Forestry Research), Director, Science & Technology–cum-Member Secretary, Andaman and Nicobar Pollution Control Committee delivered expert lecture on "Mangroves - a unique, special and vulnerable ecosystem" on the eve of International Day for the Conservation of the Mangrove Ecosystem on 26.07.2021.

Infographics released on International Day for the Conservation of the Mangrove Ecosystem

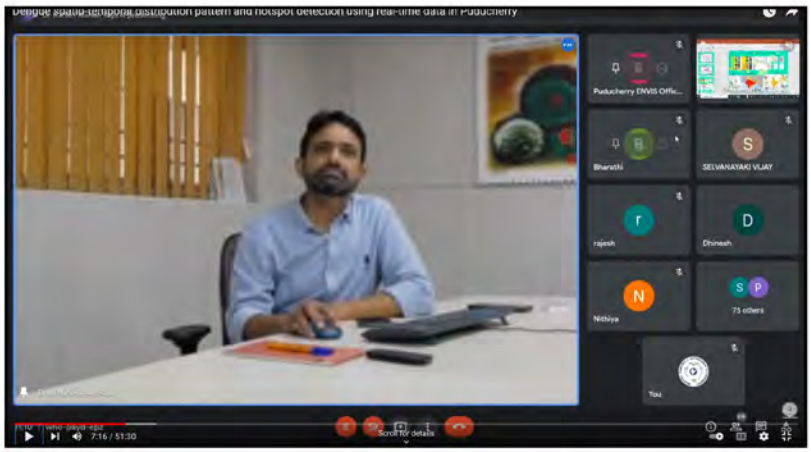
Awareness Posters & Booklet





WORLD MOSQUITO DAY ON 20th AUGUST, 2021

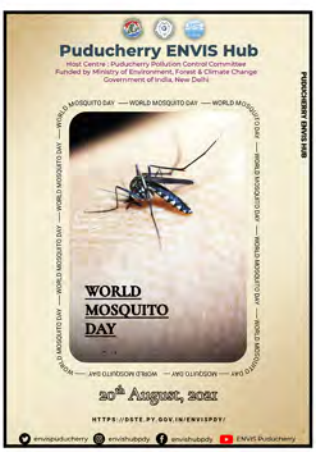
WEBINAR

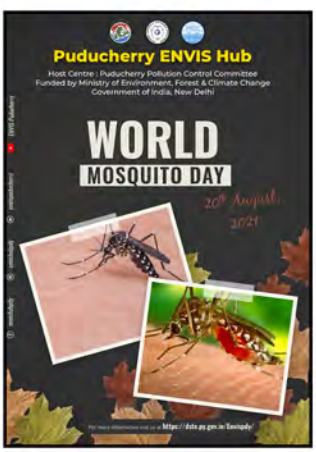


Dr. K. Hari Kishan Raju, Senior Technical Officer, ICMR - Vector Control Research Centre, Puducherry delivered expert talk on the topic 'Dengue Spatio-temporal distribution pattern and hotspot detection using real-time data in Puducherry' on the event of World Mosquito Day held on 20.08.2021. He highlighted spatial and temporal spread of vector borne diseases using GIS.

INFOGRAPHICS RELEASED ON WORLD MOSQUITO DAY

AWARENESS POSTERS & BOOKLET



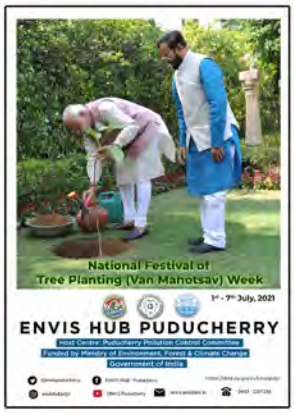


INFOGRAPHICS RELEASED DURING ENVIRONMENT RELATED EVENTS

International Plastic Bag Free Day on 03.07.2021

Awareness poster was released digitally on the occasion of International Plastic Bag Free Day on 03.07.2021, to promote the use of eco-friendly items such as paper bags or cloth bags instead of plastic bags and get rid of the single-use plastic bags.

National Festival of Tree Planting (Van Mahotsav) Week on 1st – 7th July, 2021

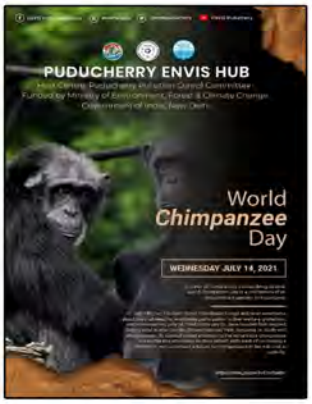


Awareness poster and pamphlet was released digitally on National Festival of Tree Planting (Van Mahotsav) Week on 1st – 7th July 2021, to raise awareness of conservation of trees and highlighted the need for planting trees.

Shark Awareness Day on 14th July, 2021

Awareness poster and pamphlet was released digitally on Shark Awareness Day on 14th July, 2021, in order to raise awareness about the conservation of sharks.

World Chimpanzee Day on 14th July, 2021



Awareness poster was released digitally on World Chimpanzee Day on 14th July, 2021, to raise awareness about the vital need, protection and conservation of chimpanzees.

World Snake Day on 16th July, 2021

Awareness poster was released digitally on World Snake Day on 16th July, 2021, to raise awareness about the different species of snakes.

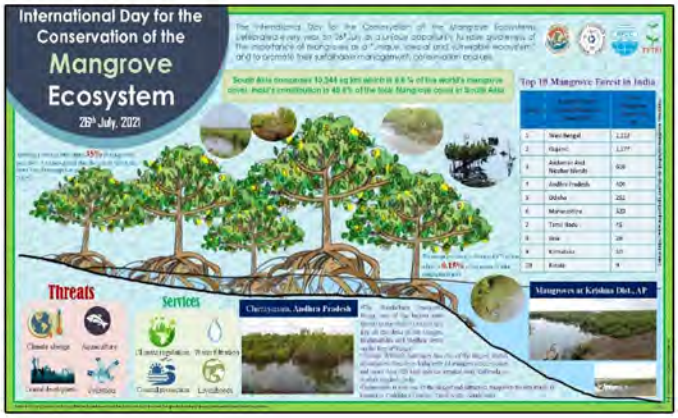
World Nature Conservation Day on 28th July, 2021

Awareness poster and pamphlet were released digitally on the occasion to raise awareness on the importance of adopting best practices to protect our natural resources.

World Tiger Day on 29th July, 2021

Awareness poster and pamphlet were released digitally on World Tiger Day on 29th July, 2021, to raise awareness for tiger conservation and the protection of their habitats.

International Day for the Conservation of the Mangrove Ecosystem on 26.07.2021

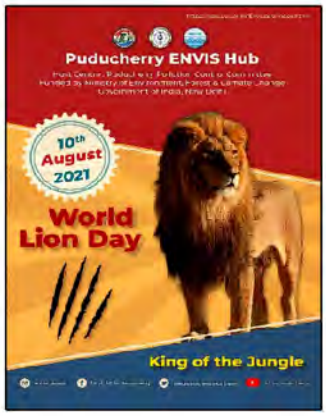


Shri. Adhar Sinha, I.A.S., Special Chief Secretary to Government, Government of Telangana and Director General, EPTRI addressed the gathering and released a poster prepared by EPTRI Envis (RP & HUB), Hyderabad & Puducherry Envis Hub to promote solutions for their sustainable management, conservation and uses of mangrove ecosystem.

International Clouded Leopard Day on 04th August, 2021

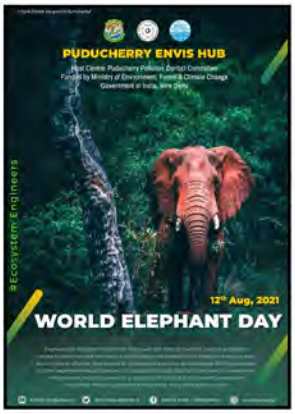
Awareness poster was released digitally on Clouded Leopard Day on 04th August 2021, to improve the numbers of Clouded leopards both in captivity and in the wild category.

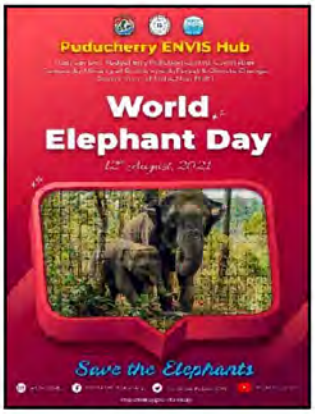
World Lion Day on 10th August, 2021



Puducherry Envis Hub released awareness Poster and Brochure digitally on World Lion Day on 10.08.2021, in order to raise awareness about lions and to mobilise support for their protection and conservation.

World Elephant Day on 12th August, 2021





Awareness Posters and Pamphlet are released digitally on World Elephant Day on 12th August 2021, to spread awareness about the critical threats elephants are facing, and to support positive solutions that will help ensure their survival.

International Wolf Day on 13th August, 2021

Awareness poster was prepared and released digitally on International Wolf Day on 13th August, 2021, to raise awareness about this magnificent canine.

Ischnura Senegalensis

Acisoma panorpoides

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