

DAILY CURRENT AFFAIRS (DCA)

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Table of Content

Humboldt's Enigma

Large Multi-Modal Models (LMMs) in Healthcare

Disruptions to Global Trade Sea Routes

E Ink Displays

World's First Successful 'Rhino IVF' Pregnancy

U.K. to ban vapes, control e-cigarettes aimed at children

News In Short

Default Bail

Exercise 'SADA TANSEEQ'

Ratle Hydro Electric Project

Lab-grown Fish

Melanistic Tiger (Black Tiger)

Laughing Gull

HUMBOLDT'S ENIGMA

Syllabus: GS3/ Environment

Context

- Humboldt's enigma is one of many puzzles of mountain biodiversity.

About

- The world's **tropical areas receive more energy** from the Sun and have greater primary productivity, which facilitates greater biological diversity.
- **Alexander von Humboldt**, has observed that mountains contribute disproportionately to the terrestrial biodiversity of Earth, especially in the tropics, where they host hotspots of extraordinary and puzzling richness.

What is Humboldt's enigma?

- **Humboldt's enigma** held that the earth's tropical areas don't contain all the biodiverse regions. There are many areas outside the tropics that are highly biodiverse. These places are mountains.
- There is a relationship between temperature, altitude, and humidity on one hand and the occurrence patterns of species (or their biodiversity) on the other.

Indian Scenario

- In the case of India the biodiversity in tropical areas, south of the **Tropic of Cancer** are supposed to be the most diverse in the country.
 - ♦ The **Western Ghats and Sri Lanka** biodiversity hotspot lies in this zone.
- However, the **Eastern Himalayas** are much more diverse. The area is often considered the second-most diverse area of perching birds in the world.

Reasons of high biodiversity in mountain range

- **Geological processes**, like uplifts, result in new habitats where new species arise, so the habitats are 'cradles'.
- Species on some climatologically stable mountains persist there for a long time, so these spots are '**museums**' that accumulate many such species over time.
- The more heterogeneous the **geological composition** of mountains is, the more biodiverse they are.

Examples of Humboldt's enigma

- Coastal tropical sky islands (mountains surrounded by lowlands), like the **Shola Sky Islands in the Western Ghats**.

- ♦ Here, old lineages have persisted on the mountain tops as climates and habitats fluctuated around them in the lower elevations.
- ♦ The oldest bird species in the Western Ghats, such as the **Sholicola and the Montecincla**, are housed on the Shola Sky Islands.
- **The northern Andes range in South America** is considered the most biodiverse place in the world.
 - ♦ Different temperatures and rainfall levels support tropical evergreen biomes in the lower elevation to the alpine and tundra biomes near the top.

Source: [TH](#)

LARGE MULTI-MODAL MODELS (LMMS) IN HEALTHCARE

Syllabus: GS3/Science and Technology

In Context

- **The World Health Organization (WHO)** has released comprehensive guidance on the **ethical use and governance** of **large multi-modal models (LMMs) in healthcare**.

About Large Multi-Modal Models (LMMs)

- Large multi-modal models refer to **advanced artificial intelligence models** that are capable of **processing and understanding** multiple types of data modalities, such as text, images, audio, and possibly others.
- LMMs are known for their ability to **mimic human communication** and perform tasks **without explicit programming**.
- Platforms like ChatGPT, Bard and Bert have become household names since their introduction only last year.
- **Five Broad Applications of LMMs in Healthcare:**
 - ♦ Diagnosis and clinical care, such as responding to patients' written queries;
 - ♦ patient-guided use for investigating symptoms and treatments;
 - ♦ clerical and administrative tasks in electronic health records;
 - ♦ medical and nursing education with simulated patient encounters;
 - ♦ and scientific research and drug development.
- **Concerns with the Use of LMMs in Healthcare:**
 - ♦ LMMs pose risks, including the generation of **false, inaccurate statements**, which could misguide health decisions.
 - ♦ The data used to train these models can suffer from **quality or bias issues**, potentially

perpetuating disparities based on race, ethnicity, sex, gender identity or age.

- ♦ Cybersecurity concerns given the sensitivity of patient's information involved.
- ♦ LLMs can be misused to **generate and disseminate highly convincing disinformation** in the form of text, audio or video content that is difficult for the public to differentiate from reliable health content.

Key Recommendations for Government:

- **Investing in public infrastructure**, like computing power and public datasets, that adhere to ethical principles.
- Using laws and regulations to ensure **LMMs meet ethical obligations** and human rights standards.
- Introducing **mandatory post-release audits and impact assessments**.
- Developers are advised to **engage a wide range of stakeholders**, including potential users and healthcare professionals, from the early stages of AI development.
- It also recommends designing LMMs for well-defined tasks with necessary accuracy and understanding potential secondary outcomes.
- Policy-makers should ensure patient safety and protection while technology firms work to commercialise LLMs.

Conclusion

- WHO's new guidance offers a roadmap for harnessing the power of LMMs in healthcare while navigating their complexities and ethical considerations.
- This initiative marks a significant step towards ensuring that AI technologies serve the public interest, particularly in the health sector.

Source: [DTE](#)

DISRUPTIONS TO GLOBAL TRADE SEA ROUTES

Syllabus: GS3/Economy

In Context

- **The United Nations Conference on Trade and Development (UNCTAD)** has raised alarms on **escalating disruptions to global trade** due to the **geopolitical tensions** and climate change affecting the **world's key trade routes**.

Waterways

- Waterways are the **most suitable and cheapest** for international trade.

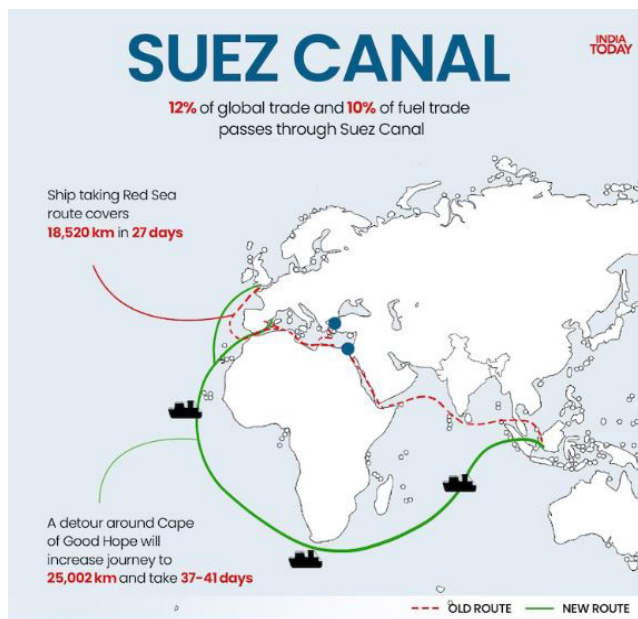
- International trade is carried out through ports and harbours which are connected with hinterlands through railways, roads or inland waterways.
- It can be classified as **national and international transportation**.
- The water transport can be divided into two parts: **Inland water transport and Ocean water transport**.

Major Choke Points in International Trade Sea Route

- **Strait of Hormuz:** Located between the **Persian Gulf and the Gulf of Oman**, the Strait of Hormuz is a crucial passage for oil shipments from the Middle East.
 - ♦ A significant portion of the world's oil supply passes through this choke point.
- **Malacca Strait:** Situated between the **Malay Peninsula and the Indonesian island of Sumatra**, the Malacca Strait is one of the busiest waterways globally.
 - ♦ It connects the Indian Ocean to the South China Sea and the Pacific Ocean, making it a key route for trade between Europe, the Middle East, and East Asia.
- **Suez Canal:** Connecting the **Mediterranean Sea to the Red Sea**, the Suez Canal is a vital shortcut for ships traveling between Europe and Asia.
 - ♦ It significantly reduces the travel distance and time compared to the alternative route around the southern tip of Africa.
- **Panama Canal:** Linking the **Atlantic and Pacific Oceans**, the Panama Canal is crucial for maritime trade between the Americas, Europe, and Asia.
 - ♦ It allows ships to bypass the lengthy and treacherous journey around the southern tip of South America.
- **Taiwan Strait:** Separating Taiwan from mainland China, the Taiwan Strait is essential for shipping in the East Asian region. It is a heavily trafficked waterway for goods moving between China, Taiwan, Japan, and other Asian nations.

Disruptions on Trade Routes

- **Suez Canal:** UNCTAD estimates that the weekly transits going through the Suez Canal **decreased by 42%** over the last two months.
 - ♦ **About 12 percent** of global trade passes through the Suez Canal.
 - ♦ Ships are now being **forced to take the Cape of Good Hope route**, which entails circumnavigating the entire African continent, it is now taking them **37–41 days** to reach their destination as compared to **27 days through Suez Canal**.



- **Panama Canal:** Simultaneously, the Panama Canal, a pivotal conduit for global trade, is **grappling with diminished water levels**, resulting in a staggering **36% reduction in total transits** over the past month compared to a year ago.
 - ♦ Panama Canal accounts for **six percent of global trade**.
 - ♦ A vessel taking the Cape Horn route, instead of the Panama Canal, takes **18 additional days of travel time**.



- **The crisis in the Red Sea**, marked by Houthi-led attacks disrupting shipping routes, has added another layer of complexity.

Implications

- **Increase in Trade Cost:** The cumulative effect of these disruptions translates into extended cargo travel distances, escalating trade costs,

and a surge in greenhouse gas emissions from shipping having to travel greater distances and at greater speed.

- ♦ Avoiding the Suez and Panama Canal necessitates more days of shipping, **resulting in increased expenses**.
- **Environmental Concerns:** Additionally, ships are compelled to travel faster to compensate for detours, burning more fuel per mile and emitting more CO₂, further exacerbating environmental concerns.
- **Increases in Food and Energy Prices:** Prolonged interruptions, particularly in container shipping, pose a direct threat to global supply chains, potentially leading to delayed deliveries and heightened costs.
 - ♦ Energy prices are witnessing a surge as gas transits are discontinued, directly impacting energy supplies, especially in Europe.
- **Impact on developing countries:** Developing countries are particularly vulnerable to these disruptions.

Way Ahead

- The organization emphasizes the urgent need for swift adaptations from the shipping industry and robust international cooperation to navigate the rapid reshaping of global trade dynamics.
- The current challenges underscore trade's vulnerability to geopolitical tensions and climate-related challenges, demanding collective efforts for sustainable solutions especially in support of countries more vulnerable to these shocks.

Source: UN

E INK DISPLAYS

Syllabus: GS3/Science and Technology

In Context

- **E Ink display screen technology** is used in reading devices like Kindle.

About

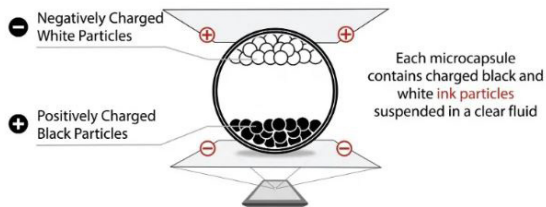
- E Ink displays are a special type of screen technology often used in **e-readers like the Amazon Kindle**.
- The technology was originally developed in the **1990s** at MIT and is now owned **by E Ink Corporation**.

Technology Used

- The screens work using **tiny microcapsules** filled with positively charged white particles and

negatively charged black ones suspended in fluid inside the display.

- By applying **positive or negative electrical charges** to different areas of the screen, the white or black particles can be made to rise to the surface, creating the text and images on the display.



Significance

- Unlike LCD and LED displays that use a backlight, **E Ink displays reflect light – just like paper.**
 - ◆ This makes them **easier on the eyes** for long reading sessions.
- They also require **very little power** since they don't need a backlight and only use energy when the image changes.
- The lack of backlighting also means that they are **easier to read under brighter lighting conditions**, which isn't the case with LCD/LED displays at all – legibility actually takes a hit under bright sunlight.

How Is E Ink Different from E Paper?

- E Paper is a broad term for any display designed to mimic the appearance of real paper.
- Meanwhile, E Ink is a specific type of E Paper display that uses millions of tiny microcapsules filled with positively charged white particles and negatively charged black particles suspended in a clear fluid.
- An excellent example of a device with an E Paper display but not an E Ink display is the Pebble smartwatch.
 - ◆ This gadget uses a low-power LCD with a reflective layer to look like paper, which is a very different implementation from E Ink.

Source: [IE](#)

WORLD'S FIRST SUCCESSFUL 'RHINO IVF' PREGNANCY

Syllabus: GS3/Science & Technology, conservation

Context:

- Scientists have achieved the **world's first in-vitro fertilization (IVF) rhino** pregnancy

which has offered hope for saving the **critically endangered northern white rhino** subspecies from extinction.

What is In-vitro fertilization (IVF)?

- In vitro fertilization (IVF) is an assisted reproductive technology (ART) that comprises a major technique for resolving infertility problems.
- It involves **combining an egg and sperm outside the body** to create an embryo, which is then transferred back into the woman's uterus for implantation and pregnancy.
- **Benefits in Livestocks:** IVF in livestock offers several advantages, particularly in the multiplication of superior germplasm, which refers to the genetic material of animals that exhibit desirable traits such as high milk production, disease resistance, or other economically important characteristics.

White Rhinoceros

- **Scientific Name:** *Ceratotherium simum*
- Also known as the **square-lipped rhinoceros**, white rhinos have a square upper lip with almost no hair.



- **Subspecies:** The white rhinoceros includes two **genetically distinct** subspecies, **northern and southern**, found in two different regions in Africa.
- **IUCN status:**
 - ◆ Northern White Rhino: **Critically Endangered**
 - ◆ Southern White Rhino: **Near Threatened**
- **Decline:** Despite their name, **white rhinos are actually grey**, used to roam freely in several countries in **east and central Africa**, but their numbers fell sharply due to **widespread poaching for their horns**.
- The **Indian rhinoceros** is different from its African counterparts with respect to possessing **only one horn** and is **vulnerable** in the IUCN Red list.

Challenges and considerations

- IVF is a **complex and expensive** medical procedure.

- **Multiple cycles** may be required for success.
- **Ethical considerations exist** regarding embryo selection and disposal.

Source: [TH](#)

U.K. TO BAN VAPES, CONTROL E-CIGARETTES AIMED AT CHILDREN

Syllabus: GS2/ Health

Context:

- The **British government** is going to **ban the sale of disposable vapes to prevent children from becoming addicted to nicotine.**

About:

- It is currently **illegal to sell vapes or tobacco to children under 18 in the U.K.**

- But, **youth vaping has tripled in the past three years in the country**, and cheap, colourful disposable vapes are a key driver.

E-cigarettes

- E-cigarettes are electronic devices **designed to simulate the act of smoking tobacco cigarettes.**
- They are also called “**e-cigs,**” “**vapes,**” “**e-hookahs,**” “**vape pens,**” and “**Electronic Nicotine Delivery Systems (ENDS).**”
- Contain a **heating element that vaporizes a liquid (e-liquid)** which typically includes nicotine, flavorings, and other chemicals.
- **Come in various forms**, including pens, mods, tanks, and pod systems.
- **Vaping** is the act of inhaling and exhaling the aerosol produced by an e-cigarette.



Associated Health Risks

- **Addictive:** Nicotine is highly addictive and can harm brain development, especially in adolescents.
 - ♦ Nicotine is a **chemical compound** present in a **tobacco plant** and all tobacco products contain nicotine, including cigarettes, cigars, smokeless tobacco, hookah tobacco, and most e-cigarettes.
- **Host of illnesses:** The e-liquid contains various chemicals, some of which are known to be harmful, causing lung damage, respiratory illnesses, and heart problems.
- **Heart attack risk:** Study of 2018 found the use of e-cigarette daily was associated with a 79% increase in heart attack risk after other variables were taken into account.

- **Carcinogenic:** According to a **white paper on e-cigarettes** by the **ICMR**, depending on the battery output voltage used, nicotine solvents can release in varying amounts potential carcinogens such as **acetaldehyde, formaldehyde and acetone.**

Regulations in India

- **Prohibition of Electronic Cigarettes Act, 2019:** It prohibits production, manufacture, import, export, transport, sale, distribution, storage and advertisement of e-cigarettes.
- **Cigarettes Act, 1975:** Tobacco control legislation in India dates back to the Cigarettes Act, 1975 which mandates the display of statutory health warnings in advertisements and on cartons and cigarette packages.

- **Cigarettes and Other Tobacco Products (COTPA) Act 2003:**
- The comprehensive tobacco control legislation aims to provide smoke-free public places and also places restrictions on tobacco advertising and promotion.
- **Tobacco Quitline Services:** These toll-free quitline services (1800-112-356) were initiated in 2016 and were expanded in September 2018.
 - ♦ These are now available in 16 languages and other local dialects from 4 centres.
- **National Health Policy 2017:** It sets an ambitious target of reducing tobacco use by **30 per cent by 2025**, which has been devised keeping in view the targets for control of NCDs.
- **WHO Framework Convention on Tobacco Control (FCTC):** India has ratified the WHO convention.

Conclusion:

- The **World Health Organization** recommends **comprehensive regulation of e-cigarettes**, including bans on flavored products and advertising targeted at youth.
- The long-term health effects of vaping are still being studied, but **research suggests it is not harmless**.

Source: [TH](#)

NEWS IN SHORT

DEFAULT BAIL

Syllabus: GS2/Polity

Context

- The Supreme Court set aside the default bail granted to Dewan Housing Finance Limited (DHFL) promoters in the case related to multi-crore loan scam.

What is default bail?

- Under **Section 167(2) of The Code of Criminal Procedure, 1973**, a Magistrate can order an accused person to be detained in the custody of the police for 15 days.
- Beyond the police custody period of 15 days, the Magistrate can authorize the detention of the accused person in judicial custody i.e., jail if necessary.
- However, the accused cannot be detained for more than:

- ♦ **Ninety days**, when an authority is investigating an offense punishable with death, life imprisonment or imprisonment for at least ten years; or
- ♦ **Sixty days**, when the authority is investigating any other offense.
- In this case, bail is granted because of the default of the investigating agency in not completing the investigation within the specified time, and it is referred to as '**default bail**' or '**compulsive bail**'.
- After the period of ninety/sixty days, if the investigation has not been completed and charge-sheet not filed, the accused person has the right to be released on bail as long as he/she applies for bail and agrees to fulfill other bail conditions (such as providing the required bail amount).

Source: [LIVE LAW](#)

EXERCISE 'SADA TANSEEQ'

Syllabus: GS3/Security; Defense

Context:

- Recently, '**SADA TANSEEQ**', a First Joint Military Exercise between **India and Saudi Arabia** inaugurated at Mahajan in Bikaner, **Rajasthan**.

About

- The exercise involved the *Establishment of Mobile Vehicle Check Post, Cordon & Search Operation, House Intervention Drill, Reflex Shooting, Slithering and Sniper Firing*.

Al Mohed A1 Hindi:

- It is an extensive **naval cooperation** between India and Saudi Arabia.
- **Participants:** The **Indian** Army contingent is represented by a Battalion from the **Brigade of the Guards** (Mechanised Infantry).
 - ♦ The **Saudi Arabian** contingent is being represented by the **Royal Saudi Land Forces**.
- **Objectives:** To train troops of both sides for joint operations in **semi-desert terrain** under *Chapter VII of the United Nations Charter*.
 - ♦ It aims to act as a platform **to achieve shared security objectives**, enhance the level of defence cooperation, and **foster bilateral relations** between the two friendly nations.

Source: PIB

RATLE HYDRO ELECTRIC PROJECT

Syllabus: GS3/Growth & Development; Infrastructure; Conservation

Context:

- Recently, the Chenab River has been diverted to expedite construction of a dam for the Ratle Hydro Electric Project in J&K.

The Chenab River:

- This is formed by the merging of two streams, the Chandra and the Bhaga that originate from the Barelacha pass of Lahaul and Spiti valley in Himachal Pradesh.
- It empties into the Sutlej River, which is tributary of the Indus River.
- Tributaries of Chenab: Thiro, Sohal, Bhunallah, and the Marusudar,
 - ◆ The Marusudar is the largest tributary of Chenab.
- The river has several hydroelectric projects, including the Baglihar Stage I and the Salal - I & II Hydroelectric projects.

About the Ratle Hydro Electric Project

- **Location:** The project is a **Run of River Scheme** on the **Chenab River**, located in the **Kishtwar district**, in the Indian Union Territory of Jammu and Kashmir.
- **Features:** It includes a 133 m tall **gravity dam** and **two power stations** adjacent to one another.
- **Execution:** It is being executed by Ratle Hydroelectric Power Corporation Limited (RHPCL), a **Joint Venture** of NHPC Limited and Government of J&K, with shareholding of 51:49%, respectively.
- **Commissioning Date:** The project is scheduled to be commissioned by 2026.

Indus Water Treaty

- In 1960, India and Pakistan signed the Indus Waters Treaty with the World Bank as a signatory of the pact.
- Under the treaty, India got control over the three eastern rivers Beas, Ravi, and Sutlej while Pakistan got control of the western rivers Indus, Jhelum, and the Chenab.
- According to the treaty, India has the right to generate hydroelectricity through the run-of-the-river (RoR) projects on the western rivers which are subject to specific criteria for design and operation.

[Source: PIB](#)

LAB-GROWN FISH

Syllabus: GS3/Agriculture; Science and Technology

Context:

- Recently, the Central Marine Fisheries Research Institute (CMFRI) is focusing on developing lab-grown fish meat.

About:

- **Cultivated fish meat or lab-grown fish meat** is produced by isolating specific cells from fish and growing them in a laboratory.
- In the **initial phase**, the CMFRI focuses on developing cell-based meat of high-value marine fishes such as kingfish, pomfret, and seer fish.
- It replicates the original flavour, texture, and nutritional qualities of the fish.
- It is **an area of research** in several countries including Israel, US, Singapore and Korea, but **none have commercialised it yet**.

Role of CMFRI

- CMFRI aims to establish India's place in the field of **cultured marine fish meat** to address the growing demand for seafood and reduce excessive pressure on wild resources.
- It is equipped with a cell culture laboratory with basic facilities, providing a solid foundation for research in cellular biology.
- It aims to handle genetic, biochemical, and analytical work related to the project.

[Source: TH](#)

MELANISTIC TIGER (BLACK TIGER)

Syllabus: Species in News

News

- Odisha is going to set up a **melanistic tiger safari**, a first of its kind in the world near **Simlipal Tiger Reserve (STR)**.

About

- The Safari will give a chance to the tourists to see "**the rare and majestic**" **melanistic tiger species** "found only in Odisha" and to create awareness about the need for their conservation.
- Simlipal has the world's highest rate of black tiger sightings in the world. According to the Tiger Status Report 2018, the reserve had last reported eight tigers.

What are Black Tigers or Melanistic Tigers?

- They are a **rare colour variant of the tiger** and are not a distinct species or geographic subspecies.

- The **abnormally dark** or black coat in such tigers is termed pseudomelanistic or false coloured.
- The **darker coat colour of the mutants** offers them a selective advantage when hunting in the dense closed-canopy and relatively darker forested areas.

Why are they black in colour?

- **Melanism** is a genetic condition (mutation) in which an increased production of melanin, a substance in the skin that produces hair, eye, and skin pigmentation, results in black (or nearly black) skin, feathers, or hair in an animal.
- Many royal Bengal tigers of Simlipal belong to a unique lineage with higher-than-normal levels of melanin, which gives them black and yellow interspersed stripes on their coats.

Simlipal Tiger Reserve (STR)

- Simlipal derives its name from **‘Simul’** (Silk Cotton) tree.
- It is located in **Odisha’s Mayurbhanj district** adjoining Jharkhand and West Bengal.
- It is **Asia’s second largest** biosphere reserve, and the country’s only wild habitat for melanistic royal Bengal tigers.
 - ♦ More than **60% of Simlipal’s** tigers are ‘black’.
- **UNESCO** added this National Park to its list of **Biosphere Reserves in May 2009**.
- Rivers like Budhabalanga, Salandi and many tributaries of Baitarani river pass from the Reserve.

Source: TH

LAUGHING GULL

Syllabus: GS3/Conservation of Environment

Context

- **Laughing gull, a migratory bird from North America**, has been sighted for the first time in the country at the **Chittari estuary** in Kasaragod, **Kerala**.

The Laughing Gull



- **Scientific name:** *Leucophaeus atricilla*
- **Features:** The bird has a dark upper part, black legs, long drooping bill, and a dark smudge on the back of the head.
- **Native to:** North and South America.



Gulls

Laughing Gull
Leucophaeus atricilla
ORDER: Charadriiformes
FAMILY: Laridae



Habitat
Shorelines



Food
Aquatic
invertebrates



Nesting
Ground



Behavior
Ground Forager



Conservation
Low Concern

- **Habitat:** Salt marshes, coastal bays, piers, beaches, ocean. Generally found only in coastal regions, but also ranging several miles inland to rivers, fields, dumps.
- **Conservation status:** Least concern

Source: [TH](#)

