

SENTINEL



CONTEXT

- Emperor Penguin (*Aptenodytes forsteri*) upgraded from Near Threatened to Endangered on the IUCN Red List, driven by climate-induced sea-ice loss.
- As a sentinel species, its decline signals broader Antarctic ecosystem stress, populations projected to halve by the 2080s.



WHAT IS A SENTINEL SPECIES

It is a plant or animal whose health reflects the overall condition of the ecosystem it inhabits.



They respond quickly and visibly to environmental stressors such as pollution, disease, and climate change.



They act as early warning systems, allowing detection of ecological imbalance before it becomes widespread.



ADDITIONAL INFORMATION – INTERNATIONAL UNION OF CONSERVATION OF NATURE



- Establishment** - 1948.
- Set up in** - Gland, Switzerland.
- Objective** - To promote international cooperation and to provide scientific knowledge and tools to aid conservation action.
- IUCN Red List** - It established the IUCN Red List of Threatened Species in 1964.

IUCN RED LIST



It is a list compiled by the IUCN, which contains the world's most comprehensive information on the conservation status of plants, animals, and fungus species.



Species in the IUCN Red List - There are 143000 species on the Red List.



India's membership in IUCN - India became a member in 1969



The IUCN classification - The IUCN classification of species is based on their extinction/conservation status. They are as follows

EXAMPLES OF SENTINEL SPECIES



Amphibians (Frogs): Frogs have permeable skin, making them highly sensitive to pollutants and pathogens. Decline in frog populations is often an early indicator of ecosystem stress.



Canaries in Coal Mines: Historically used to detect carbon monoxide poisoning. They showed distress before humans due to faster metabolism.



Honeybees: Used to monitor agricultural chemicals and pesticide loads. Decline in bee populations signals ecosystem imbalance and pollination crisis.



Polar Bears: Indicators of Arctic ecosystem health and contaminant accumulation. Reflect impacts of climate change and ice loss.

IUCN CLASSIFICATION OF SPECIES

EX

Extinct (EX)



EW

Extinct in the Wild (EW)



CR

Critically Endangered (CR)



EN

Endangered (EN)



VU

Vulnerable (VU)



NT

Near Threatened (NT)



LC

Least Concern (LC)



DD

Data Deficient (DD)



NE

Not Evaluated (NE)

