# Protection of Antarctic Ecosystems

## Why in news?

- *Recently, a new study assessed how Antarctica's species will respond to future threats.*
- *It also talks about the conservation efforts and costs that are needed to protect Antarctic ecosystems.*

## What is the significance of Antarctica?

- Antarctica provides priceless services to the planet and humankind.
- It helps regulate the global climate by driving atmospheric circulation and ocean currents, and absorbing heat and carbon dioxide.
- Antarctica even drives weather patterns in Australia.
- Antarctica's land-based species have adapted to survive the coldest, windiest, highest, driest continent on Earth.
- The species includes two flowering plants, hardy moss and lichens, numerous microbes, tough invertebrates, and breeding seabirds including the emperor penguins and Adélie penguins.

## What are the threats to Antarctic biodiversity?

- Antarctica's plants and animals face numerous threats. Chief among them is climate change.
- As global warming worsens, Antarctica's ice-free areas are predicted to expand, rapidly changing the habitat available for wildlife.
- As extreme weather events such as heatwaves become more frequent, Antarctica's plants and animals are expected to suffer.
- Also, scientists and tourists visiting the icy continent each year can harm the environment through pollution and disturbing the ground or plants.
- The combination of more human visitors and milder temperatures in Antarctica also creates the conditions for invasive species to thrive.

## What are the findings of the study?

### Response to threats

- Under a worst-case scenario, the populations of 97% of Antarctic terrestrial species and breeding seabirds could decline between now and 2100, if current conservation efforts stay on the same trajectory.
- At best, the populations of 37% of species would decline.
- The most likely scenario is a decline in 65% of the continent's plants and wildlife by the year 2100.

**Threats to some species**

- **Emperor penguins -** The emperor penguin relies on ice for breeding, and is the most vulnerable of Antarctica's species.
- In the worst-case scenario, the emperor penguin is at risk of extinction by 2100 – the only species in our study facing this fate.
- **Scottnema lindsayae** - The nematode worm Scottnema lindsayae is another Antarctic specialist species.
- The species lives in extremely dry soils, and is at risk as warming and ice-melt increases soil moisture.

**Beneficial to some species**

- Climate change won't lead to a decline in all Antarctic species - in fact, some may benefit initially.
- These include the two Antarctic plants, some **mosses** and the **gentoo penguin**.
- These species may increase their populations and become more widely distributed in the event of more liquid water (as opposed to ice), more ice-free land and warmer temperatures.

## What could be done?

- Current conservation efforts are insufficient to conserve Antarctic species in a changing world.
- As Antarctica faces increasing pressure from climate change and human activities, a combination of regional and global conservation efforts is needed.
- The experts of the study identified **ten management strategies** to mitigate threats to the continent's land-based species.
- These strategies include measures such as
    - Mitigating climate change (listed as the "influence external policy" strategy),
    - Minimise impacts of human activity,
    - Managing non-native species and disease,
    - Managing and protecting species,
    - Managing existing and new infrastructure,
    - Protecting areas and vegetation,
    - Granting special protections to species, and
    - Increasing bio-security to prevent introductions of non-native species.

> *Reducing climate change to no more than 2 degrees Celsius of warming would benefit up to 68% of terrestrial species and breeding seabirds.*

## How much would it all cost?

- Since climate change is the biggest threat to Antarctica's biodiversity, limiting global warming is the most effective way to secure their future.
- Just **USD 23 million per year** would be enough to implement 10 key strategies to reduce threats to the biodiversity of Antarctica.

- This relatively small sum would benefit up to 84% of terrestrial bird, mammal, and plant groups.
- By comparison, the cost to recover Australia's threatened species is estimated at more than USD 1.2 billion per year.

**Reference**

Indian Express | Why Antarctica's emperor penguins could be extinct by 2100

## Quick Facts

### Emperor Penguins

- Emperor Penguin (*Aptenodytes forsteri*) is a carnivorous flightless bird species.
- Emperors are the largest of all penguins. It is also the tallest and heaviest of all penguins.
- They live in colonies on the Antarctic ice and in the frigid surrounding waters.
- Its diet consists of fish, crustaceans, such as krill, and cephalopods, such as squid.
- **IUCN status -** Near threatened

SHANKAR IAS PARLIAMENT
Information is Empowering