



# WASTE & BIODIVERSITY MANAGEMENT AT AIRPORTS

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# INTRODUCTION: WASTE & BIODIVERSITY AT AIRPORTS



## Plastic Waste:

More than 430 million tons of plastic are produced each year, two-thirds of which is cast aside as waste after just one use. If trends continue, plastic waste will triple by 2060, with dire consequences for both ecosystems and human health

*"United Nations Foundation, PROTECT OUR PLANET FROM PLASTIC POLLUTION: 5 THINGS TO KNOW"*



## Biodiversity:

Biological diversity is the variety of life on Earth and the natural patterns it forms. The biodiversity seen today is the result of 4.5 billion years of evolution and, increasingly, of human influence as well. It forms the web of life, of which humans are integral and upon which people and the planet so fully depend.

*"UNEP, UNEP and Biodiversity"*

# **GREEN AIRPORTS RECOGNITION**

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# ABOUT GREEN AIRPORTS RECOGNITION

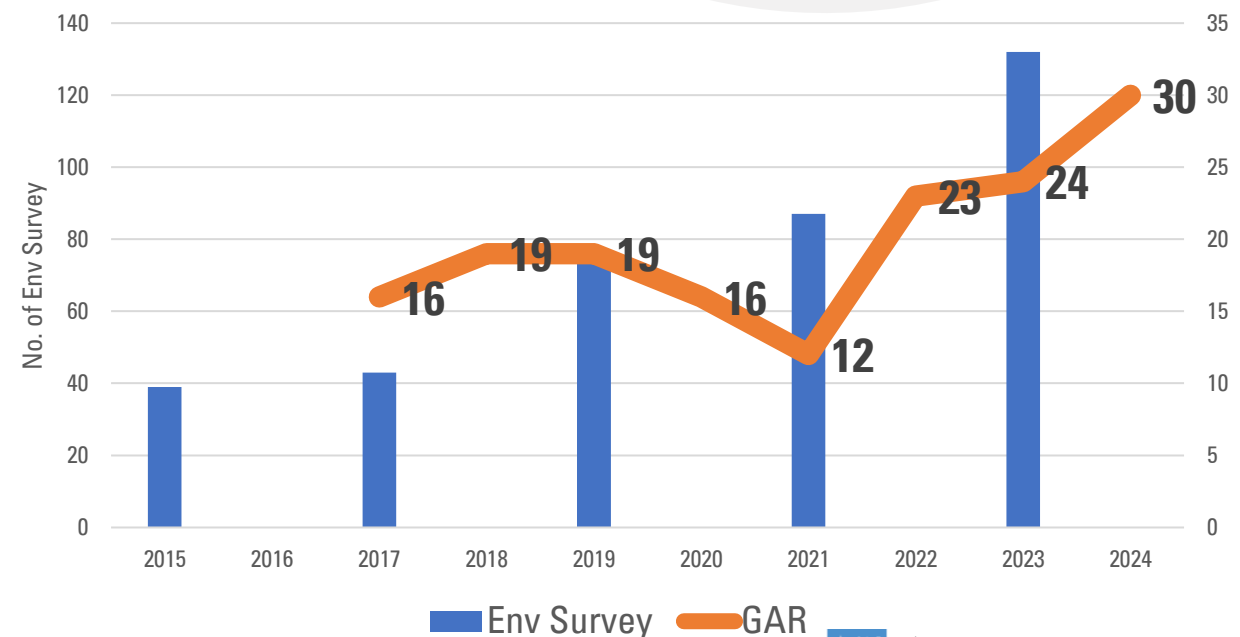
- ❑ Objective to promote environmental best practices
- ❑ Recognize ACI members who has outstanding accomplishments in their environment projects

**\*NOTE: This is not a competition!**



Year	Theme	Numbers
2024	Biodiversity and Nature-Based Solutions	30
2023	Single-Use Plastic Elimination	24
2022	Carbon Management	23
2021	Air Quality Management	12
2020	Water Management	16
2019	Green Airport Infrastructure	19
2018	Waste Minimization	19
2017	Energy Management	16

## Environmental Survey and GAR trends





# ELIGIBILITY FOR THE GREEN AIRPORTS RECOGNITION

- ACI APAC & MID airport member with good standing
- Environment project completed in the past five years
- **Airport members completing the current Environmental Survey**
- The report will be reviewed by panel of judges and the winners will be awarded during the ACI Asia-Pacific & Middle East Regional Assembly

## < Environmental Aspects >

Each year, a different theme is chosen from the following environmental aspects:

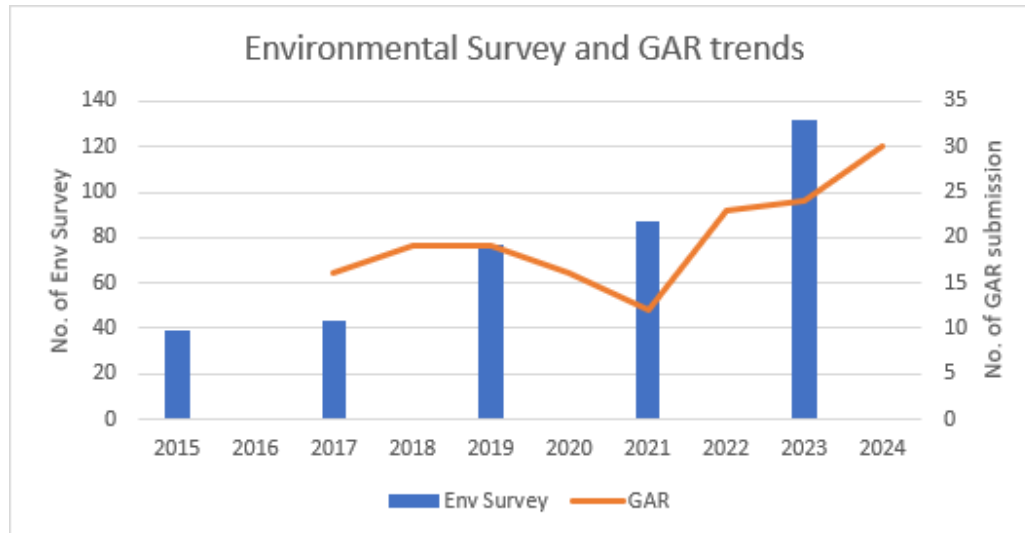
- Environmental Policy and Management (including green procurement)
- Noise
- Air quality
- Waste
- Water (including both municipal water usage and wastewater discharge)
- Energy
- Carbon
- Biodiversity
- Ground transportation
- Land & water contamination
- Others



# GREEN AIRPORTS RECOGNITION 2024: BIODIVERSITY AND NATURE-BASED SOLUTIONS



- 8<sup>th</sup> year of championing environmental excellence
- Theme: **Biodiversity and Nature-Based Solutions**
- 30 airport companies competed for GAR 2024
- ❖ Encouraging airports to submit their best practices in preserving Biodiversity and utilizing Nature-Based Solutions at their premises,
- ❖ Ranging from wetland restoration and creation, balancing wildlife species and airport operation, wildlife trafficking prevention, ecosystems restoration or carbon removal through Nature-Based Solutions.
- Number of applicants growing year by year  
 2022 -> 23 airport companies  
 2023 -> 24 airport companies  
**2024 -> 30 airport companies**



# GAR RECOGNIZED AIRPORTS AND TOPICS

## ❑ GAR 2023 – Single-Use Plastic Elimination



- In 2023, received **24** submissions, and recognised **12** airports and published best practices publication in May 2023, Kobe, Japan

## ❑ GAR 2024 – Biodiversity and Nature-based Solutions



- In 2024, received **30** submissions, and recognised **12** airports and published best practices publication in May 2024, Riyadh, Saudi Arabia.

❖ GAR 2025 - Sustainable Energy at Airport out mid November in 2025

# **CASE STUDIES & BEST PRACTICES**

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# CASE STUDY(1): NATURE-BASED SOLUTION TO WILD LIFE HAZARD MANAGEMENT

## • BACKGROUND

Free Bird movement and airport operations are challenging tasks, owing to passenger safety, delays in flight operations, and bird injury.



<https://preciseflight.com/article/aviation-bird-strikes-solutions/>



Conventional methods like gas canons and bird scarring guns have been used to control bird movement, but these generate noise and air pollution issues.



Additionally, pesticides used for soil treatment can affect soil properties and the food chain, leading to bird and ecosystem bioaccumulation.

# CASE STUDY(1): NATURE-BASED SOLUTION TO WILD LIFE HAZARD MANAGEMENT

## • IMPLEMENTATION OF NATURE-BASED SOLUTION



- Grass height maintenance to restrict insect growth



- Soil treatment with worm for insect pests



- Airside storm drainage management to restrict water accumulation



- Farrow's light trap installed to trap insects.



- Drain covers with nylon mesh which restrict bird movement inside drain.



- Remove open garbage dumping bins

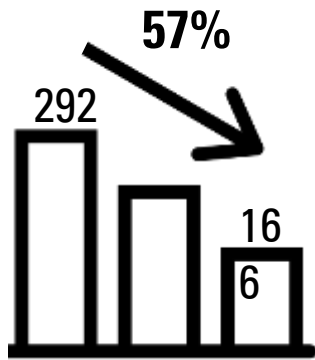


- Bird feeding awareness campaign or Joint awareness program

# CASE STUDY(1): NATURE-BASED SOLUTION TO WILD LIFE HAZARD MANAGEMENT

## • RESULTS AND BENEFITS

### BIRD STRIKES



- Reducing bird strikes in the last three years.
- Bird strike rate reduced by 57% in last 3-years.

### BIRD ROOT



- Identified root cause of the bird movement

### GAS CANNON



- Reduced gas canons usage from 30 Nos to 3 in 1 year.

<https://www.arlingtonmagazine.com/what-are-bird-cannons/>

### Airport Safe & Aircraft Operations

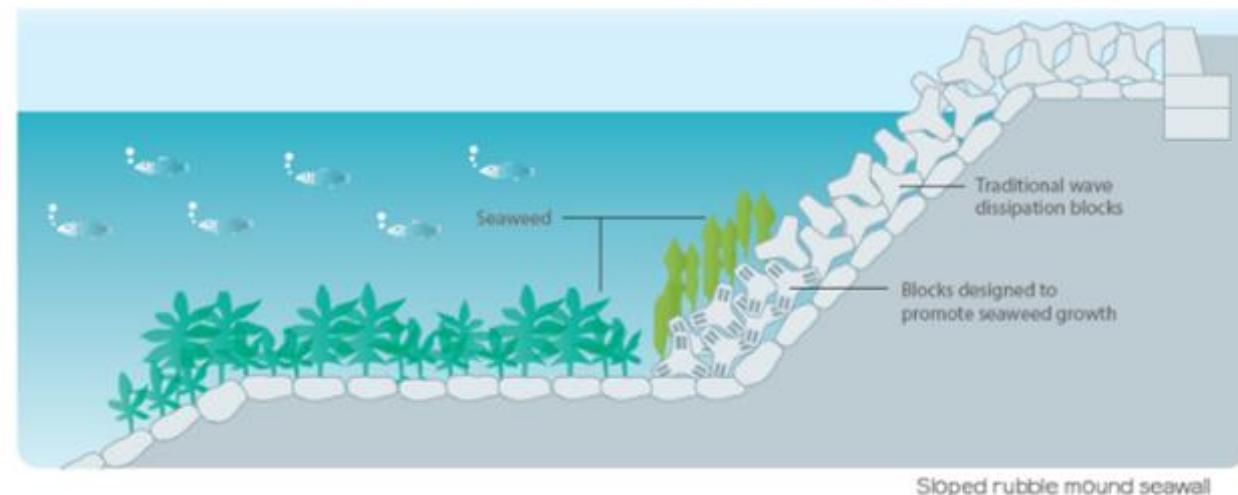
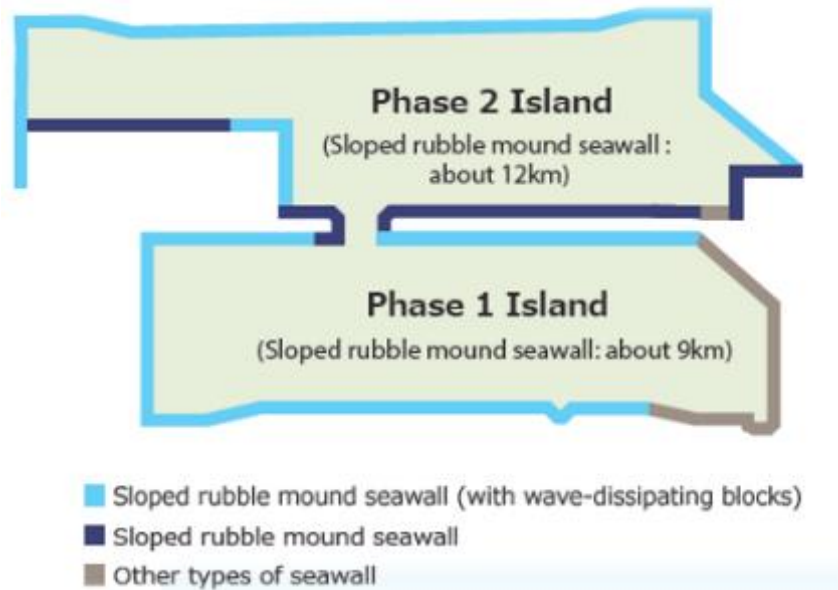


### Ecological Wildlife Hazard Management



# CASE STUDY(2): SEAWEED BEDS OVERVIEW AT KIX

- From the planning stage, the airport was designed to harmonize with the marine environment, and sloped rubble mound seawalls were primarily used for the revetment for most of the total 24 km length.
- Sloped rubble mound seawalls allow light to reach a wide area. In addition to that, the various innovations actively implemented during the construction of the airport island created rich seaweed beds environment. This area has become home to a wide variety of marine life.





## CASE STUDY(2): OUTLINE OF THE PROJECT

- We transplanted mother algae to areas of the airport island where seaweed was scarce, promoting establishment of the seedlings. We transplanted approximately 35,000 large seaweed for four years.

Restoration of seaweed beds following installation of tetrapod  
From FY2019 to 2021



Transplanting large seaweed in  
FY2022



- ✓ Obtained credit certification in 2022 for 103.2 tons of carbon sequestration over the five years from FY2017 to FY2021.
- ✓ Recognized as one of the sites contributing to achieving the global biodiversity target "30 by 30" in 2023 and to be registered in the international database as an OECM soon.
- ✓ Provided the local municipality with seaweed (150 plants) grown on the airport island seawall in 2023.

# CASE STUDY(2): CREATE BLUE CARBON



## Obtained J Blue Credits certification on December 14, 2022

Seaweed beds around KIX have been recognized as a sink for CO<sub>2</sub>

The amount of CO<sub>2</sub> absorbed by seaweed growing on the seawall around Kansai International Airport was quantified, and J Blue Credits\* was certified and issued. This indicates that our efforts to create a seaweed bed environment can also contribute to the reduction of CO<sub>2</sub> emissions.

**CO<sub>2</sub> absorption: 103.2 t-CO<sub>2</sub> for 5 years from FY2017 to FY2021**



J Blue Credit Certification



Seaweed beds

Surface area of seaweed beds:

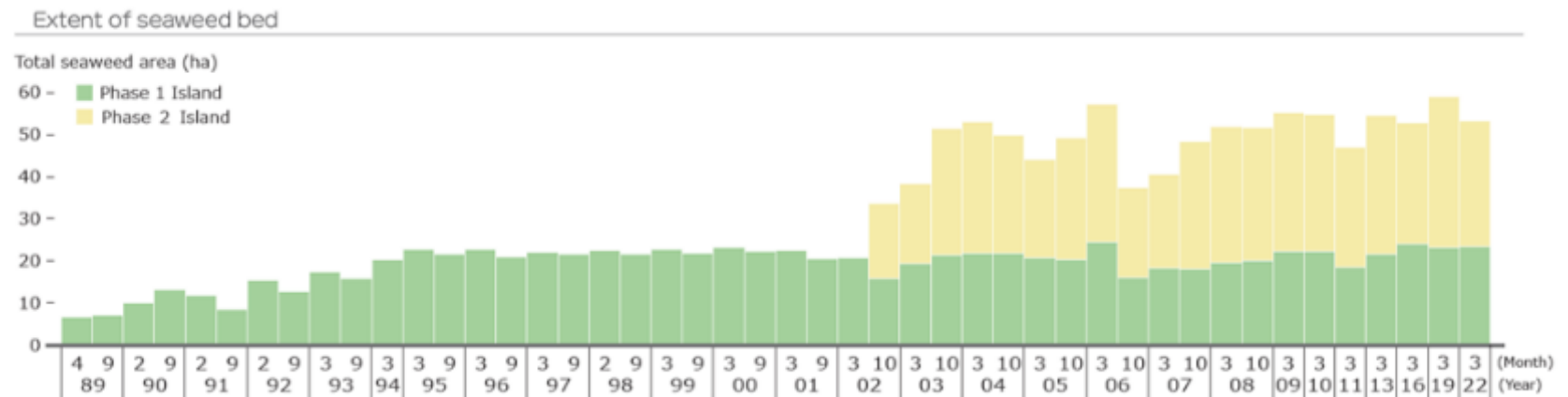
**54 ha**

(surveyed in March 2022)

Monetary value:

**47,000 dollars**

(From 2017 to 2021)



\* J Blue Credits: Credits certified, issued and managed by JBE (Japan Blue Economy Technology Research Association)  
Credits are certified and issued through assessment and verification by a third-party committee independent of JBE.



The Voice of  
Asia-Pacific &  
Middle East Airports

# PLATINUM RECOGNIZED PROJECTS IN GAR 2023: SINGLE-USE PLASTIC ELIMINATION



**Chhatrapati Shivaji Maharaj International Airport: Single Use Plastic Free Airport – Mumbai**  
→ Initiative to have 100% SUP replaced with biodegradable materials



**Kempegowda International Airport: Plastics Circularity at KIAB**  
→ Solutions for the city plastic waste and to set benchmark in Plastics Circularity



**Paved Roads from Plastic Waste**



**Central Japan International Airport: Bottle to Bottle' sustainable use of PET bottle**  
→ Effective recycling of PET bottles in collaboration with related businesses.



**Mangaluru International Airport: SUP Free Airport**  
→ Videos on digital display boards and Flight Information Display System



# PLATINUM RECOGNIZED PROJECTS IN GAR 2024: BIODIVERSITY & NATURE-BASED SOLUTIONS



**Hong Kong Airport: Implementation of Marine Ecology and Fisheries Enhancement Measures**  
→ Implemented an artificial reef deployment project to benefit marine habitats.



**Kansai Airport: Creating a rich seaweed bed and blue carbon**  
→ Conducted a seaweed bed transplanting initiative to establish a carbon sink



**Mactan-Cebu Airport: Coastal Clean-up**  
→ Launched a marine preservation commitment, collecting solid waste in clean-up events



**Queenstown Airport: Shotover Wetland restoration**  
→ Engaged in a 10-year project to conserve biodiversity by replanting native species





**THANK  
YOU**

# THE VOICE OF ASIA-PACIFIC AND MIDDLE EAST AIRPORTS



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