Biodiversity and Nature-Based Solutions: an emerging topic for the aviation sector

By ICAO Secretariat

Introduction on Biological Diversity Crisis and Need for Urgent Action

Climate change has become an increasingly important issue in our societies, in particular since the adoption of the **Rio Declaration on Environment and Development** during the Earth Summit in 1992, which marked a key milestone in the commitment of States to tackle climate change and protect the environment. All stakeholders are now engaged in the sustainable transition of all sectors and, while the impacts of climate warming and the need to engage and implement climate mitigation and climate adaptation measures is acknowledged, scientists have called attention to an even bigger environmental crisis related to biological diversity loss.

The term biodiversity derived from "Biological diversity" refers to the "variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" according the **Convention on Biological Diversity (CBD)** adopted in 1992 at the Nairobi Conference[1].

The objectives of this Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Since the 1960', a grave decline of biodiversity has been observed and sometimes described as a 6th mass extinction. Human activities play the major role in this unprecedented loss of biodiversity and the loss of habitats and ecosystems, land degradation and desertification, climate change and pollution and waste are jeopardizing the right to a healthy and sustainable environment and underlining the fragility of the functioning of those ecosystems.

The *WWF Living Planet Report 2024: A planet in Crisis*[2], highlighted a global environmental crisis and emphasized a "catastrophic decline of 73% in wildlife populations over the last 50 years, as measures by the Living Planet Index (LPI)", noting that the LPI is developed by the Zoological Society of London which monitor population trends accords species.

The importance of biodiversity to maintain healthy ecosystems that sustain life on Earth is highlighted by multiple organizations including through the holistic "One Health" approach that recognizes the health of ecosystems, animals, and humans as interconnected.

1 https://www.cbd.int/convention
2 https://www.arcticwwf.org/newsroom/news/wwf-living-planet-report-2024-a-planet-in-crisis/

While the **Intergovernmental Panel on Climate Change (IPCC)** provides the latest state of the science related to climate change, the **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)**, established in 2012, is committed to strengthening the role of science in public decision-making on biodiversity and ecosystem services.

To achieve this, IPBES respond to government requests for information on biodiversity and ecosystem services, identify and prioritize key scientific information needed for policymakers, perform regular and timely, scientifically credible, independent, and peer-reviewed assessments of knowledge on biodiversity and ecosystem services on a comprehensive global, regional, and sub-regional scale, support policy formation and implementation by identifying relevant tools and methodologies and identify and create key capacity-building tools to support the use of science in policy.

The **International Union for Conservation of Nature and Natural Resources (IUCN)** is a global environmental network aiming to influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

Achieving global targets, such as halting and reversing biodiversity loss by 2030 as outlined in the Global Biodiversity Framework, adopted in 2022, and limiting global temperature rise to 1.5ºC under the Paris Agreement, demands bold and immediate action. Unfortunately, current national commitments and efforts fall far short of what's necessary to meet these goals and prevent dangerous tipping points. To reach the Global Biodiversity Framework's target of safeguarding 30 per cent of the planet's lands, waters, and seas by 2030, a substantial expansion of effective protected areas is crucial. Presently, only 16 per cent of land and 8 per cent of oceans are protected, highlighting the urgency of the task ahead.

Role of Aviation to tackle Biodiversity Loss

Biodiversity and ecosystems conservation requires global, comprehensive and coordinated action, including from the aviation sector. Biodiversity has become an important consideration in ICAO's work, in areas such as aerial forest fire mitigation, species protection near airports, the prevention of wildlife trafficking, and the deployment of sustainable aviation fuels (SAFs).

Conservation of biodiversity in CORSIA framework

ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) incorporates robust sustainability criteria to ensure that the deployment of sustainable aviation fuels (SAF) supports, rather than undermines, biodiversity and conservation goals.

According to the ICAO document ***CORSIA Sustainability Criteria for CORSIA Eligible Fuels***[3], within "Conservation" theme and under the principle that the production of CORSIA, SAF should maintain biodiversity, conservation value, and ecosystem services, the following sustainability criteria for this theme must be followed:

- **Criterion 7.1**: CORSIA SAF will not be made from biomass obtained from areas that, due to their biodiversity, conservation value, or ecosystem services, are protected by the State having jurisdiction over that area, unless evidence is provided that shows the activity does not interfere with the protection purposes.
- **Criterion 7.2**: Low invasive-risk feedstock will be selected for cultivation and appropriate controls will be adopted with the intention of preventing the uncontrolled spread of cultivated alien species and modified microorganisms
- **Criterion 7.3**: Operational practices will be implemented to avoid adverse effects on areas that, due their biodiversity, conservation value, or ecosystem services, are protected by the State having jurisdiction over that area.

3 https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx

These criteria collectively ensure that CORSIA-eligible fuels production does not interfere with the protection purposes of areas recognized by the State for their biodiversity, conservation value, or ecosystem services.

In addition to the sustainability criteria applied to CORSIA-eligible fuels such as SAF and LCAF, biodiversity protection is also addressed through the eligibility framework for **CORSIA Eligible Emissions Units (EEUs)**.

The *ICAO document on CORSIA Eligible Emissions Units*[4] requires that offset programmes demonstrate robust environmental and social safeguards, including for biodiversity and ecosystems.

These provisions ensure that projects generating CORSIA-eligible carbon offsets do not compromise biodiversity and instead contribute to broader environmental integrity. Combined with the safeguards for sustainable fuels, this creates a holistic biodiversity-conscious approach across CORSIA's climate mitigation principles.

Biodiversity at Airports

Growing demand for transport infrastructures such as airports are putting pressure into biodiversity in a number of ways, a major sustainability challenge for airports is the balance between their construction and operation with the safeguard of natural ecosystems and biodiversity conservation under pressure by their activities.

Airports are fully engaged in this challenge and many initiatives exist showcasing the commitment of airports to protect biodiversity, when it comes to infrastructure planning, landscape management, operations, data monitoring, noise, light pollution and nature-based solutions.[5] More information is provided in other articles of this Chapter.

The Green Airports Recognition 2024 by Airports Council International (ACI) Asia-Pacific & Middle East was under the theme "Biodiversity and Nature-Based Solutions" and recognized the efforts supporting wetland restoration and creation, balancing wildlife species with airport operations, preventing wildlife trafficking, ecosystem restoration, and carbon removal through natural means[6].

ICAO's Committee on Aviation Environmental Protection (CAEP) will develop a publication on Biodiversity and Nature-Based Solutions as part of the Eco-Airport Toolkit e-collection which provide practical and ready-to-use information related to airport planning and sustainable management.

ICAO events also cover this important topic to take stock of the initiatives related to biodiversity conservation developed around the world and to create the necessary dialogue amongst the stakeholders to implement the necessary measures. The ICAO Green Airport Seminars are the opportunity to gather knowledge and best practices from airports, including measures related to biodiversity protection. For example, the 2024 Green Airports Seminar held in Athens, Greece, provided an opportunity for Dakar Blaise Diagne Airport to inform about their multiple activities planned in the airport environmental plan, including biodiversity protection, management of green spaces, water resources, water, air and soil pollution as well as management of bird disturbance. Dakar Blaise Diagne Airport highlighted three flagship actions including the development of an ethnobotanical garden, reforestation of the resettlement site and ecosystem restoration in a Matine Protected Area, bird observatory to monitor migratory species[7]. The ICAO 2024 Green Airports Seminar is detailed in Chapter 12 – Green Airports of this Report.

Such events emphasize the importance of taking into consideration biodiversity conservation in the management of infrastructure or operations and highlighted the need

4 https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Emissions-Units.aspx

5 Biodiversity Conservation Initiatives at Airport's Level By Anastasios Anagnostopoulos (Athens International Airport S.A.), Nick Gabriel (Gatwick Airport), Melina Santos Vanderlinder (Aeropuertos Dominicanos - AERODOM), and Wendy Avis (Vancouver International Airport); https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ENVReport2022_Art71.pdf

6 Green Airports Recognition 2024: Biodiversity and Nature-Based Solutions Press Release; https://www.airportcarbonaccreditation.org/green-airports-recognition-2024-biodiversity-and-nature-based-solutions/

7 Presentation by Yacine Kebe, Safety Environment Quality Manager Dakar Blaise Diagne Airport, 2024 ICAO Green Airports Seminar: Accessible on the ICAO public website: https://www.icao.int/Meetings/greenairports2024/Documents/Presentations/Session%203%20Part%20II/4%20-%20ACI%20Africa%20-%20Yacine%20Kebe%20final.pdf

for advocacy, coordinated approach, as well as assistance and capacity building.

Climate Adaptation and Nature-Based Solutions

Nature-based solutions (NbS) are increasingly recognized as essential tools for climate adaptation and for halting biodiversity loss. These solutions use natural processes and ecosystem services to address societal challenges such as flooding, extreme heat, and poor air quality—while at the same time enhancing biodiversity. ICAO is exploring and supporting nature-based approaches in the aviation context, particularly at the airport level, to strengthen resilience and provide co-benefits to communities and ecosystems. More information on climate adaptation and resilience is available in Chapter 13 – Climate Adaptation & Resilience of this Report.

Forest Fire Fighting

Forests cover about 30% of Earth's land surface. Behind the oceans, forests are the second largest carbon sink on the planet, not to mention the carbon stored. They are also home to 80% of the world's terrestrial biodiversity. As provided in IPCC 2021 Climate Report, widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred due to the human influence. Climate change is already affecting every inhabited region across the globe, and every year large areas of forest are affected by fires worldwide. The number of fires and their size varies from year to year, but the risk of fire is increasing globally. Fires devastate ecosystems and threaten the safety of people as they spread.

With increasing awareness of the importance of safeguarding forests, the problem of forest fires has risen over the past years to the forefront of political and public awareness. The 2020 United Nations Summit on biodiversity highlighted the crisis facing humanity from the degradation of biodiversity and the urgent need to accelerate action on biodiversity for sustainable development. It emphasized biodiversity conservation as a necessary condition for the achievements of Agenda 2030 for Sustainable Development and the fight against climate change.

Emergency responses to forest fire fighting involves both ground and air intervention forces. Although ground forces remain the principal lever of action and the coordinator of the overall response, aircraft play a crucial complementary role to control the escalation of fires. The aerial response to fires has improved over time, and contributing to this has been the continuous improvements of monitoring tools and early warning systems. However, there are always opportunities for further improvements.

The *ICAO Flying Forest Fire Fighting Dialogue (I4F)*[8] was held in 2021 aiming at exchanging the information on existing activities, technologies and arrangements and facilitating the cooperation on aviation forest fire fighting activities among States and other relevant stakeholders, by sharing knowledge, experience and resources as well as by discussing possible areas of improvements and cooperation.

It was acknowledged that the alarming trends in increasing number of wildfires across the globe are accelerating. extensive information on international firefighting practices, and on aviation solutions, expressing support to these crucial actions worldwide. The participants from the Global Fire Monitoring Center (GFMC), International Fire Aviation Working Group (IFAWG), and Joint United Nations Environment/Office for the Coordination of Humanitarian Affairs (UNEP/OCHA) Environment Unit highlighted the importance of ICAO's role.

The participants underscored the importance of identifying focal points across ICAO Member States in order to increase awareness and gain support for forest fire fighting efforts. The need for more outreach, certification work, awareness and innovations on fire fighting, forecasting, mitigation and prevention were also highlighted. Specific proposals were made on coordination towards facilitating new international aviation regulations and harmonization across States.

Advocating for a coordinated approach

ICAO continues to foster dialogue and coordination with relevant international bodies to ensure that aviation's environmental actions align with broader global

8 https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ICAO ENV Report 2022 F4.pdf

sustainability agendas. A notable example of this was ICAO's participation in the United Nations Biodiversity Conference (COP15), held in December 2022 in Montreal under the theme "Ecological Civilization – Building a Shared Future for All Life on Earth". During the High-level Segment, the ICAO Secretary General delivered a keynote statement, highlighting how ICAO's work, particularly the development of sustainability criteria and eligible emissions units under CORSIA, as well as efforts to promote sustainable airport operations, contributes to the goals of the post-2022 Global Biodiversity Framework.

In parallel, ICAO took part in the UN Heads of Agencies Dialogue, convened by the UN Environment Management Group (EMG), and engaged in several bilateral meetings with high-level representatives from States and international organizations to explore avenues for enhanced cooperation. These engagements reflect ICAO's commitment to a coordinated, cross-sectoral approach to biodiversity and environmental protection.

These ICAO's cooperative activities and other key messages are also further reflected in Chapter 16 – Multistakeholder Cooperation of this Report.