Plant Conservation Strategy for Luxembourg 2022-2030

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TARGET 1

By 2030, all users, including country authorities, have access to comprehensive and authoritative national expertise, as well as online information systems, documentation and inventories of the flora and natural habitats of Luxembourg.

Target Aims

Provide online access to comprehensive and scientifically verified national plant information: up to date information on plant taxa, their status and distribution (including atlases) and national plant information systems, including the number of new plant species discovered and described. Contribute the data to the World Flora Online.

Provide an online flora of Luxembourg: 100 % plant taxa are included in a scientifically verified and up-to-date online flora.

Provide smart tools/technologies for plant identifications for all plant taxa of Luxembourg.

Means of measuring

- Number/proportion of plants included in the national plant information system
- Number/proportion of plants with up-to-date information available
- Number/proportion of plants included in the online flora
- Number/proportion of plants with identification tools available

Practical implementation

Keep the data accurate and up to date:

- Regular monitoring of all plant taxa in Luxembourg

Provide access to the data:

- Develop and administer web platform(s)
- Edit species descriptions and texts
- Develop identification tools

TARGET 2

By 2030, all known plant taxa in Luxembourg have been assessed for their extinction risk and conservation status.

Target Aims

100 % of all plant taxa in Luxembourg have their conservation status assessed in national assessment processes.

Means of measuring

- Percentage of plants with conservation status assessed
- Number of group specific Red Lists available

Practical implementation

- Update Red List of vascular plants
- Update Red List of bryophytes
- Complete Red List of algae
- Complete Red List of fungi
- Complete Red List of lichens
- Make data available in ThreatSearch! (database of all plants that have been assessed globally or nationally)
- Update national legislation on protection of threatened plant species[1]

TARGET 3

By 2030 species recovery plans have been developed for all known rare and threatened plant taxa of Luxembourg.

Target Aims

Species recovery plans provide an invaluable tool in order to support and coordinate reintroductions of threatened plants and restoration of threatened ecosystems. They display the management requirements of threatened species and state the conditions for sustainable harvesting of plant species from the wild. Having species recovery plans available will allow us to make priority lists for which plants conservation actions are most urgent.

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[1] Loi modifiée du 18 juillet 2018 concernant la protection de la nature et des ressources naturelles, Règlement grand-ducal du 8 janvier 2010 concernant la protection intégrale et partielle de certaines espèces de la flore sauvage

Means of measuring

- Number of species recovery plans in place
- Number of species included in habitat action plans
- Number of plant species included in landscape level spatial conservation plans

Practical implementation

- Draw species (recovery) action plans with predefined format and structure for all endangered plant species

TARGET 4

By 2030 viable populations of at least 75 % of known rare, threatened or socio-economically important wild plant species are effectively conserved and managed in situ and ex situ.

Target Aims

Practical implementation of plant taxa conservation measures as defined in target 3.

Means of measuring

- Number of species included in ex situ collections (Data made available in PlantSearch, database of ex situ collections in botanic gardens managed by BGCI)
- Number of species included in integrated biodiversity spatial prioritization plans[2]?
- Number of species that are effectively protected in situ
- Number of known crop wild relatives protected in situ
- Number of species included in ecological sensitive zones in development sector plans
- Number of publications on plant conservation and management measures implemented.
- Number of reports/species lists from management plans of protected areas/in situ conservation areas.
- Percentage (30 %) of plant-based products from different countries sold under sustainable management regimes (such as FairWild).

Practical implementation

- Coordinate restoration/reintroduction/protection measures (common database)
- Document seed/plant proveniences

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[2] Natura 2000 zones; Règlement grand-ducal du 1er août 2018 établissant les biotopes protégés, les habitats d'intérêt communautaire et les habitats des espèces d'intérêt communautaire pour lesquelles l'état de conservation a été évalué non favorable, et précisant les mesures de réduction, de destruction ou de détérioration y relatives. – Mémorial A, Journal officiel du Grand-Duché de Luxembourg N° 774 du 5 septembre 2018: 1–23.

- Increase the number of research teams involved in research programs that support integrated plant conservation strategies.

TARGET 5

By 2030, 50 % of crop varieties, landraces and other domesticated socio-economically valuable plant species are conserved, and viable populations are effectively managed in situ and ex situ, to prevent genetic erosion and safeguarding their genetic diversity.

Target aims

This target aims to ensure that crop varieties, farmers' varieties, plants of horticultural merit, landraces and other domesticated socio-economically and culturally valuable plant species are available to support use in agriculture, forestry, horticulture, and other sustainable developmental and social needs, as well as natural systems that provide ecosystem services. 'Genetic diversity' should be interpreted to include crop varieties, traits and variation within genes.

Means of measuring

- National and regional networks for the conservation of cultivars of horticultural and agricultural importance
- Accessions of cultivars, landraces and CWRs in seed banks and ex situ agricultural collections
- Use of and studies completed on local use of suitably adapted landraces/cultivars.
- Conservation of current and old varieties of horticultural merit

Practical implementation

- Inventory of regional crop varieties and landraces
- Coordinate existing projects and databases in collaboration with ASTA, SEED, Bongert.LU, …
- Promote use of old landraces in agriculture (livestock, orchards, vegetable production, pasture, …)

TARGET 6

By 2030, 30 % of each ecological region[3] are adequately protected for the purpose of plant conservation, and 100 % of areas important for plant diversity are identified and protected.

Target Aims

The core of this target is about the conservation of ecosystems at national and/or regional levels. This target is assumed to include ensuring good connectivity between individual and systems of protected areas as an important part of their conservation.

This target seeks to ensure that by 2030, the rate of loss of natural habitats and important areas for plant diversity, including forests, is brought close to zero, and natural habitat degradation and fragmentation is significantly reduced.

In relation to areas important for plant diversity, the target has two components – identifying the areas important for plant diversity and then ensuring their effective protection. The key challenge will be to ensure that appropriate management measures are taken to maintain and enhance plant diversity.

Means of measuring

- Number of the country's important areas for plant diversity identified[4] and conserved
- Measurements of protected areas of various landscape and habitat categories, including forests, wetlands, peatlands, grasslands and other types
- Proportion of ecosystems with 50 % of their original extent effectively protected
- Measurement of the use of corridors and protected area connectivity (and gaps) in protected area development and management

Practical implementation

- Inventory of Important Plant Areas (IPAs) and Key Biodiversity Areas (KBAs) and the plant species they contain completed - time series landcover loss data preferably generated at national level adequately through effective management plans, networks and other actions that halt habitat and plant species loss and degradation.
- Databases and information systems in place for adequate measurement.

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[3] Administration des eaux et forêts du grand-duché de Luxembourg (Hrsg.) 1995. Naturräumliche Gliederung Luxemburgs. Ausweisung ökologischer Regionen für den Waldbau mit Karte der Wuchsgebiete und Wuchsbezirke, 71 S.
[4] NSG, Natura 2000, Art. 17 etc...

TARGET 7

By 2030, the multiple anthropogenic pressures on vulnerable plant species and their ecosystems including from pollution, excess nutrients from agriculture and development, are understood, minimized, in order to maintain ecosystem integrity and functioning.

Target Aims

Given the ecological inertias related to climate change, it is important to urgently reduce other anthropogenic pressures on vulnerable ecosystems, such as land-based pollution/sedimentation, unsustainable harvesting and physical pressures, to increase the resilience of such vulnerable ecosystems to climate change. This can be accomplished by addressing those pressures, which are most amenable to rapid positive changes and would include activities such as reducing pollution and excess nutrients from agriculture and development, which have negative consequences on ecosystems.

Means of measuring

- Proportion of ecosystems that are being impacted that have adaptation projects being conducted to minimise anthropogenic impacts
- Incidence of human-induced ecosystem failure
- Health and well-being of communities who depend directly on local ecosystem goods and services
- Number of plans, programs and strategies related to the protection and management of vulnerable ecosystems
- Proportion of products derived from sustainable sources

Practical implementation

- Legislation around control or use of pesticides, fertilisers that are proven to be harmful to biodiversity or ecosystem function
- 30 % of organic farming
- 50 % reduction of pesticide use
- Reduction of fertilisation by use of alternative techniques
- Creation of large buffering zones to prevent nutrient influx into nutrient poor habitats of threatened plant taxa

TARGET 8

By 2030, the detrimental impact of invasive alien species (IAS) and biological invasions is eliminated or reduced in 50 % of areas important for plant diversity by eradication or control measures of IAS, and measures to manage and control priority pathways to prevent new invasive species introductions and/or establishment are in place.

Target Aims

A national strategy concerning IAS is indispensable as well as effective action plans to prevent new biological invasions and to manage important areas for plant diversity that are invaded. Considering biological invasions as a phenomenon and not just invasive alien species, these action plans need to be designed (using the ecosystem approach) to address the damage done to plant species and/or their communities and to restore ecosystem functions, goods and services. As climate change is enhancing the spread and impact of many invasive alien species, action plans should take adaptation to climate change into account.

Means of measuring

- Number of species assessed with the ISEIA protocol on Black, Watch and Alert Lists
- Number of action plans elaborated
- Number of action plans implemented
- Number of species eradicated, confined or controlled
- Number of areas important for plant diversity in which detrimental impact of IAS has been eliminated or reduced
- Number of awareness raising campaigns (flyers/brochures/….)

Practical implementation

- Real-time update of ISEIA risk assessments
- Expansion of the national Alert System to other data sources
- Cartography of all species (Black and Watch List) by 2025
- Implementation of a national strategy concerning IAS by 2023
- Action plans for all species of EU concern (implementation in progress by 2025)
- Prompt eradication of all new appearing IAS in IAPB
- Compilation of a National List of IAS of Luxembourg concern
- Suggest substitute non-invasive plant species to be used in horticulture and gardening
- Implementation of the national action plans concerning invasive alien species
- Management of the "priority pathways" of introduction

TARGET 9

By 2030, at least 50 % of degraded ecosystems are being restored using appropriate native plant species to be resilient, biodiverse and to provide ecosystem services.

Target aims

This target places native species and biodiversity at the centre of ecological restoration efforts. Planting schemes solely [or primarily] to achieve carbon sequestration and for commercial forestry can have detrimental impacts on biodiversity, especially where they involve exotic monocultures which displace native species and create low-value landscapes for biodiversity.

The achievement of this target assumes that steps are in place to identify degraded ecosystems and put in place the measures that are required to ensure their appropriate restoration. Ecosystem services can be defined as including carbon sequestration, climate change adaptation and mitigation and other services. Biodiverse ecosystems are generally more resilient against potential damage or degradation. International and national Standards for the Practices of Ecological Restoration are available to be applied to ecological restoration.

Means of measuring

- Number of studies on the impacts of climate change on plant diversity within ecosystems
- Number of national projects focused on soil restoration and eco-health completed
- Pollinator habitat restoration etc.
- Number of conservation programmes including the use of corridors and connected landscapes restoration measures
- Number of projects delivering restoration up to the standards of accepted international best practice

Practical implementation

- Implementation of the national plan for nature protection (PNPN[5])
- Implementation of the national strategy for the conservation and restoration of species rich grasslands[6] [7]

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[5] Plan national concernant la protection de la nature (PNPN) en vigueur

[6] WOLFF, C., S. SCHNEIDER, G. BIVER & T. KOZLIK (2020): Anleitung zu Grünland-Renaturierungsverfahren von artenreichen Wiesen & Weiden – Wiederherstellung von mageren Flachlandmähwiesen, FFH-Lebensraumtyp 6510 – als Leitfaden u. a. zur Einbindung in Kompensationsverfahren, Umweltministerium Luxemburg (MECDD) & SICONA, 21 S.

[7] MECDD (2020): Strategie zum Erhalt und Wiederherstellung des artenreichen Grünlandes in Luxemburg 2020-2030.

- 600 plant species included in habitat restoration/recovery programmes
- 30 habitats in restoration/recovery programmes (PNPN)

TARGET 10

By 2030, at least 50 % of areas under agriculture and at least 75 % of areas under forestry are managed sustainably, ensuring the conservation of associated wild and crop plant diversity.

Target aims

An ultimate goal is for all production lands to be managed sustainably, without impacts on plant diversity. In the context of this target, agricultural land may be defined as "production lands" where the primary purpose is agriculture, including horticulture, grazing, or wood production. The sectors to be considered under this target include, inter alia, croplands, pasture, forestry, including harvesting of non-timber forest products, and aquaculture. Sustainable management for plant diversity implies that a number of objectives are integrated into the management of such production lands: (i) the conservation of plant diversity including genetic diversity; (ii) protection of other plant species in the production landscape that are unique, threatened, or of particular socio-economic value; and (iii) use of management practices that avoid significant adverse impacts on plant diversity in surrounding ecosystems. The target therefore encourages the use of good agricultural and forestry practices.

Means of measuring

- Number of sector-based development plans and best practice guidelines that include conservation targets for plant species of conservation concern (threatened, restricted range and socio-economically important plants)
- Number of business and biodiversity initiatives
- Percentages of land under sustainable management regimes, such as organic production.
- Number of programmes actively promoting the inclusion of locally beneficial biologically important species into agricultural practices
- Number of training initiatives in place for the sustainable management of areas under agriculture, aquaculture and forestry, ensuring the conservation of associated wild and crop plant diversity.

Practical implementation

- Implementation of the national plan for nature protection (PNPN) and governmental programs[8]
- 50 % change in the proportion of production sector footprint under sustainable management
- Conservation integrated into land use planning/agricultural development

TARGET 11

By 2030, 100 % of wild harvested plants are managed and harvested sustainably and in accordance with relevant national[9] and international regulations and applying ecosystem-based approaches, so that overexploitation and ecosystem degradation is prevented.

Target aims

This target is consistent with the second objective of the Convention on sustainable use and its long-term goal to achieve sustainable sourcing of all naturally occurring plant resources. This target can be interpreted to include wild harvested plants and the products derived from them. Plant-based products harvested from wild sources include food products, timber, wood-based products, fibre products, ornamental, medicinal and other plants for direct use. Sustainable management and harvesting aims to ensure that practices do not result in a decline in the diversity, value or supply of wild harvested plants.

Means of measuring

- Number of products sold under sustainable management regimes and certification
- Studies on sustainable levels of harvesting
- National certification

Practical implementation

- Conservation through sustainable use of native plant products e.g. juniper, arnica, berries
- Commercialisation of regional products of wild plants

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[8] Projet de loi Programme forestier national, projet PDR

[9] Loi modifiée du 18 juillet 2018 concernant la protection de la nature et des ressources naturelles, Règlement grand-ducal du 8 janvier 2010 concernant la protection intégrale et partielle de certaines espèces de la flore sauvage

TARGET 12

By 2030, there has been a substantial reduction in the number of threatened plant species illegally traded in/through Luxembourg.

Target aims

This target is consistent with the main purpose of the CITES Strategic Plan: "No species of wild flora subject to unsustainable exploitation because of international trade". The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) provides an international framework for the protection of wild flora threatened by international trade.

International regulations are applied, consistent and in harmony with the Convention and other relevant international obligations.

Means of measuring

- The proportion of plants threatened by international trade with management interventions in place to promote sustainable trade
- Measurements of decline in illegal trade on endangered plant species and customs seizures
- Measurements of public awareness of illegal trade in endangered plant species and capacity of customs/regulatory officials

Practical implementation

- National implementation of international legislations: CITES, Nagoya, Habitat directive, etc.
- Collaboration among concerned authorities at the national level

TARGET 13

By 2030, the value of plant diversity is recognised by the country's people, including, the ecosystem services they provide and the steps that can be taken to conserve and use plants sustainably.

Target aims

There is an urgent need to effectively communicate the value of plant diversity to all relevant sectors, including indigenous and local communities, young people, the business sector, media and policy makers. There is also a need to refocus a communication strategy to address livelihoods, ecosystem products and services. Implementation of this target will

also require the engagement of both the informal and formal education sectors at all levels, including primary, secondary and tertiary education.

Key messages for a communication/marketing plan for this target will require the incorporation of plant conservation into national climate change communication strategies, and into other relevant resource management documents or strategies.

Means of measuring
- Numbers of special programmes for young people and number of participants in plant/nature based initiatives (e.g. determination training courses)
- Number of people taking part in citizen science programmes monitoring plant diversity; and number of relevant citizen science programmes and volumes of research data generated
- Number of people visiting nature parks and protected areas
- Number of learning materials that include information on plants and their importance being used in national (school) curricula and tertiary level botanical training
- Percentage of school children (overall) reached by plant-based learning programs
- Numbers of tertiary courses of relevance to plant conservation, plant biology and botany, and numbers of graduates and post graduate students participating
- Records of impact of education messaging on visitors gathered from visitor surveys (i.e. attitude changes)
- Proportion of touristic related products based directly or indirectly on plants

Practical implementation

- Public surveys of citizens, consumers and sectoral participants on plant awareness and understanding issues (such as botanic garden visitors)
- Implementation of government policies, documents and strategies (in Tourism, Forestry, Health etc.) referencing plants

TARGET 14

By 2030, with the full and effective participation of local communities, at all relevant levels, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of plant diversity, are respected, safeguarded and preserved to support customary and cultural use of these resources.

Target aims

Respect and secure the knowledge base of plant resources used to secure livelihoods, food security and health care, especially for local communities. This measure is incorporated to

ensure that future generations accessing these resources can continue to benefit from their sustainable use. The target should be implemented consistent with the Convention's programme of work on Article 8(j) and related provisions[10]. This target may, in the long run, help local communities to adapt to emerging environmental challenges such as climate change.

Means of measuring

- Number of projects undertaken by local communities to safeguard traditional knowledge, innovations and practices relevant for the conservation, sustainable and customary use of plant diversity.
- Number of studies completed on plant traditional knowledge, innovations and practices of indigenous and local communities.
- Surface managed with traditional methods (ha)
- Number of traditional uses of plant species
- Number of genotypes in biocultural registers

Practical implementation

- Support traditional use of plant species (e.g. *Arnica montana, Juniperus communis*, *Meum athamanticum*, *Rosa canina*, *Sambucus nigra*, *Salix viminalis*, *Primula veris*, *Menyanthes trifoliata*, …)
- Establish biocultural registers: horticultural varieties of apples, pears, plums, grapevines, potatoes, roses, sorb tree
- Support traditional management practices: tillage hedges, slope irrigation (*Fléizen*), coppice woods (*Louhecken*), plagging, sheep transhumance …
- Support traditional products: buckwheat dumplings (*Stärzelen*), eau de vie, cider, gin, Sauerkraut

TARGET 15

By 2030, at the latest, plant diversity values have been integrated into rural and urban development strategies and planning processes and have been implemented in natural capital and other national accounting mechanisms and reporting systems worldwide.

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[10] CBD Article 8(j) - Traditional Knowledge, Innovations and Practices

Target aims

Integrate plant diversity values into rural and urban development strategies and planning processes on community and national level. This implies that issues of plant conservation are integrated by all concerned ministries, governmental institutes and municipalities, and that a close collaboration is established among them.

Means of measuring

- Number of planning projects integrating plant conservation issues
- Substantial reduction of pesticide use in urban and rural areas
- Number of communes in biodiversity community syndicates

Practical implementation

- State planning, regional planning[11]
- Development plants (PAP, PAG)
- Pesticide free action[12]

TARGET 16

By 2025 the implementation of Luxembourg's Strategy for Plant Conservation has started in an effective and participatory way, and by 2030 all capacities, institutions, networks, resources and public engagement necessary to implement this strategy and action plans have been installed.

Target aims

The National plant strategy has been accepted by all relevant bodies and is implemented in all national projects. Capacities, institutions, networks, resources and public engagement have been built up. A national botanical conservatory has been created.

Means of measuring

- Total budget per year dedicated to national plant conservation strategy
- Number of communes engaged in nature conservation syndicates
- Number of scientists in plant conservation biology
- Number of farmers engaged in biodiversity conservation schemes
- Number of practitioners in biotope management
- Number of persons participating in citizen science plant projects

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[11] Plans sectoriels

[12] Plan d'action national de réduction des produits phytopharmaceutiques (PAN)

Practical implementation

Networks:

- Natura 2000
- Nature conservation syndicates
- Biological stations[13]
- Nature parks

Financial resources:

- National Research Fund (FNR)
- Environmental fund (MECDD)
- EU-projects
- Nature & forest administration

Institutions & capacities:

- Research centre at the National Museum of Natural History (MNHNL): conservation biology, conservation genetics, biodiversity databases
- Creation of a national botanical conservatory: seed bank, restauration/reintroduction measures and project coordination
- Nature & forest administration

TARGET 17

By 2030, at the latest, incentives and subsidies, including afforestation, restoration and carbon sequestration incentives, that are harmful to wild plant diversity are eliminated in order to minimize or avoid detrimental impacts, and positive incentives for the conservation and sustainable use of plant diversity are developed and applied.

Target aims

Substantial and widespread changes to incentives, including subsidies, are required to ensure sustainability. Ending or reforming incentives, including subsidies, harmful to plant diversity is a critical and necessary first step that would also generate net socio-economic benefits. In addition, the creation or further development of positive incentives for the conservation and sustainable use of plant diversity, and plant ecosystems, provided that such incentives are in harmony with the Convention and other relevant international obligations, could also help in the implementation of the Strategic Plan by providing

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[13] Stations biologiques

financial or other incentives to encourage actors to undertake actions which would benefit plants. [Based on the Technical Rationale for Aichi Target 3].

Means of measuring

- Budget dedicated for Ecosystem Services reflected in national incentive 'schemes' to support the sustainable use of ecosystems
- Number and types of positive incentive measures developed and applied

Practical implementation

- Further development of national incentive 'schemes' to support the sustainable use of agricultural and forest ecosystems[14]
- Review and identify incentives and subsidies that are harmful to wild plant diversity
- Inventory of the economic and financial values of plant diversity and plant-based ecosystem services captured via payments for ecosystem services, user fees, taxes and other mechanisms

TARGET 18

By 2030, appropriate policies and legislation are in place to facilitate efficient and effective international and other exchange and transfer of plant materials, expertise and knowledge needed to support conservation, research and sustainable use of plant diversity.

Means of measuring

- Inventory of policies signed and check if necessary, legislation was implemented
- Collaboration of national institutions concerned

Practical implementation

- Harmonisation and implementation of appropriate policies and legislation

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[14] Accord coalition, PDR, Projet de loi Programme forestier national