

# Caucasus Plant Initiative: A Regional Plant Conservation Strategy

*Paeonia wittmanniana*



**BGCI**  
*Plants for the Planet*

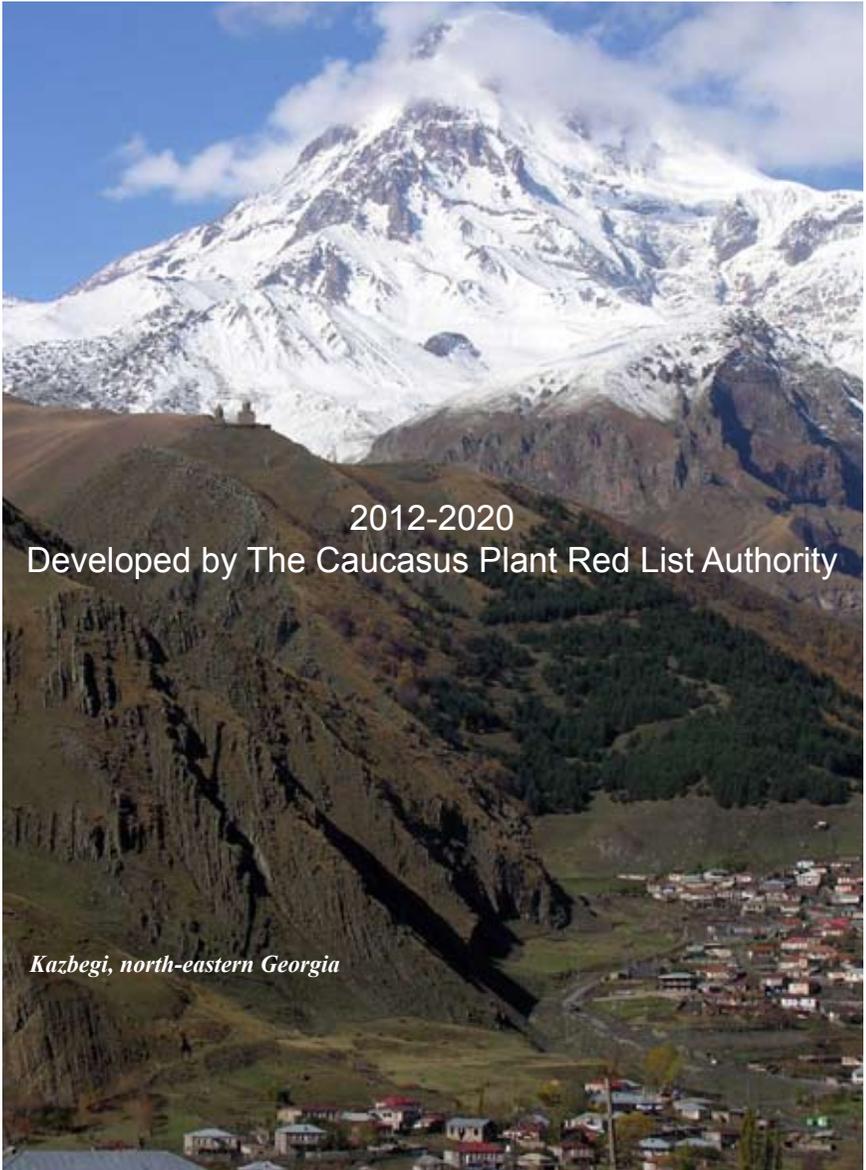
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 MISSOURI BOTANICAL GARDEN



MISSOURI  
BOTANICAL  
GARDEN

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2012-2020  
Developed by The Caucasus Plant Red List Authority

*Kazbegi, north-eastern Georgia*

The targets of The Caucasus Plant Initiative (CPI), a regional Plant Conservation Strategy, correspond to the targets of the 2010-2020 Global Strategy for Plant Conservation.

The present document also illustrates the relevance of CPI targets to the targets/actions in the revised and updated Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012). Whenever possible, the CPI should be considered together with ECP in plant conservation and sustainable use planning.

According to the 10th Meeting of the Conference of Parties of the UN Convention on Biological Diversity (CBD) held in Japan, the member countries are requested to revise their existing National Biodiversity Strategies and Action Plans (NBSAPs) according to the “CBD Strategic Plan for Biodiversity 2011-2020”.

The statements of The Caucasus Plant Initiative are intended to be incorporated into the National Biodiversity Strategies and Action Plans (NBSAPs) of the Caucasus countries.

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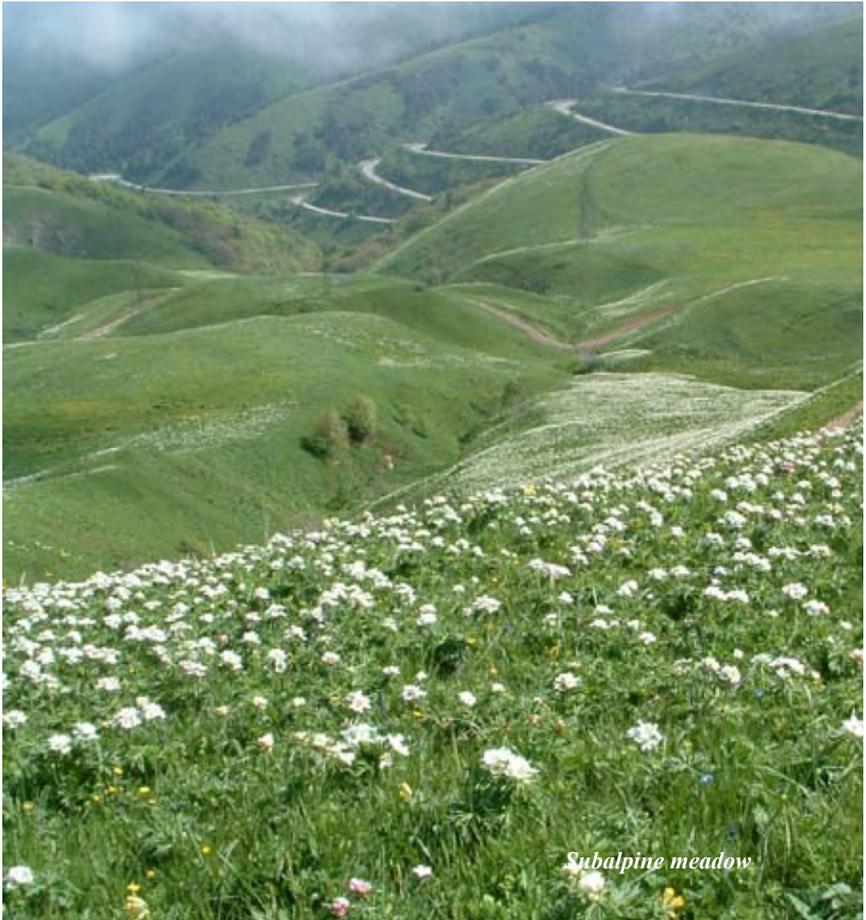
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*Subalpine meadow*

## Introduction

“The Caucasus Ecoregion, historically interpreted as the isthmus between the Black and Caspian seas, covers a total area of 580,000 km<sup>2</sup>, and spans six countries. The Greater Caucasus Mountain Range with its lofty peaks forms a formidable barrier between the northern and southern parts of the Caucasus Ecoregion. The North Caucasus includes the Russian republics of Adygeya, Karachayev-Cherkessiya, Kabardino-Balkariya, Northern Osetiya, Ingushetiya, Chechnya, and Dagestan, and of the Krasnodar and Stavropol territories (“krays”). The area to the south of the Greater Caucasus Range – known as the South Caucasus – includes all of Armenia, Azerbaijan, Georgia, as well as part of northeastern Turkey and part of northwestern Iran.” (Williams et al. 2006)

“It is one of WWF’s 35 “priority places” and of 34 “biodiversity hotspots” identified by Conservation international as being the richest and at the same time most threatened reservoirs of plant and animal life on Earth.” (Zazanashvili et al. 2012)

“The Caucasus is a hotspot of plant and animal diversity and endemism. Located at a biological crossroads, species from Central and Northern Europe, Central Asia and the Middle East, and North Africa mingle with endemics found nowhere else. Over 6,500 species of vascular plants are found in the Caucasus. At least a quarter of the plants is found nowhere else on Earth – the highest level of endemism in the Temperate Zone of the Northern Hemisphere.

One-third of the endemic plants in the Caucasus Ecoregion is thought to have originated in the Greater Caucasus Range. Seventeen endemic plant genera thrive in the Caucasus, nine of which are associated with high mountain communities. Plant associations from the Tertiary period have been preserved in the Colchic and Hyrcanic refugia – centers of plant endemism.” (Williams et al. 2006)

Williams L., Zazanashvili N., Sanadiradze G. & A. Kandaurov (eds.). Ecoregional Conservation Plan for the Caucasus. WWF, KfW, BMZ, CEPF, MacArthur Foundation. Tbilisi, 2006.

Retrieved from: [http://assets.panda.org/downloads/ecp\\_second\\_edition.pdf](http://assets.panda.org/downloads/ecp_second_edition.pdf)

Zazanashvili N., Garforth M., Jungius H., Gamkrelidze T. with participation of Ch. Montalvo (eds.). Ecoregion Conservation Plan for the Caucasus. 2012 revised and updated edition. WWF, KfW, Federal Ministry for Economic Cooperation and Development. Tbilisi, 2012.

Retrieved from: [http://wwf.panda.org/what\\_we\\_do/where\\_we\\_work/black\\_sea\\_basin/caucasus/?205437/Ecoregion-Conservation-Plan-for-the-Caucasus-revised](http://wwf.panda.org/what_we_do/where_we_work/black_sea_basin/caucasus/?205437/Ecoregion-Conservation-Plan-for-the-Caucasus-revised)



## Background

From 2006 to 2010, the project **Coordination and Development of Plant Red List Assessments for the Caucasus Biodiversity Hotspot** was implemented by the IUCN Species Survival Commission in collaboration with Missouri Botanical Garden, USA, the WWF Caucasus Programme Office, and botanists from six countries of the Caucasus (Armenia, Azerbaijan, Georgia, Iran, Russia, and Turkey).

The project aimed to provide a series of Red List training and validation workshops specifically tailored to the Caucasus region so that local botanists could use internationally accepted methods for plant conservation assessment and monitoring (the IUCN Red List Categories and Criteria) and the Species Information Service Data Entry Module (SIS DEM) as tools for data management and analysis.

A tree Red Listing workshop organized by Fauna and Flora International with advice from the Chair of the IUCN/SSC Global Tree Specialist Group, held in Tbilisi, Georgia, in September, 2005 initiated the first phase of this broad IUCN plant Red Listing initiative.

The work has resulted in a comprehensive overview of the distribution and conservation status of the endemic plant species of the Caucasus region based on current knowledge.

A map of the Caucasus region produced by WWF Caucasus was initially used for the project; however, it was suggested that the border of the Caucasus region be extended southwards into the territory of Iran based on local plant cover characteristics. The map with the extended borders was then used as base map to distinguish endemic plants of the Caucasus.

The plant taxa initially suggested as endemic to the Caucasus Biodiversity Hotspot were thoroughly verified with respect to their distribution within the Hotspot borders by the project consultants. This resulted in a comprehensive list of the region's endemic taxa containing as many as 2,810 species, subspecies, and varieties, a significant increase over the 1,600 species estimated in the original project proposal and mentioned in the Ecoregional Conservation Plan for the Caucasus (see above).

Of these, 1,250 endemic taxa occurring in 1-3 countries of the Hotspot, i.e., all national endemics as well as those occurring in 2 or 3 countries, and therefore most likely to fall into one of the threatened categories, were evaluated for their conservation status using the IUCN Red List Categories and Criteria.

The Caucasus Plant Red List Authority was established under the auspices of the IUCN Species Survival Commission within the framework of the above project and the series of Red List workshops successfully introduced participants to the IUCN Red List process and highlighted the use and relevance of assessments for conservation planning and the development of the present **Caucasus Plant Initiative: a regional Plant Conservation Strategy**, targets of which correspond to the targets of the Global Strategy for Plant Conservation.



*Cerastium argenteum*



## **Caucasus Plant Initiative (CPI) Objective I: Plant diversity is well understood, documented and recognized.**

### **CPI Target 1: An online Flora of all known plants of the Caucasus.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**A. Plan for improving the framework conditions to achieve the goals of the ECP: Long-Term Target by 2025 A7.** Regional research, information, and learning centers work to increase and transfer knowledge of biodiversity issues in the Ecoregion: **Medium-Term Target by 2020 A7.1.** The Caucasus regional biodiversity monitoring network and information database are in place: **Actions by 2015 A7.1.1.** Further develop the database and website and the mechanism for updating the database.

#### **Where we are now**

The first *Flora of the Caucasus* was compiled and published by Alexander Grossheim in four volumes from 1928 to 1934. The Flora was then reissued in seven volumes from 1939 to 1967.

The Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, commenced publication of the *Caucasus Flora Conspectus* in 2003 and has issued three volumes of the book to date.

Both of these regional Floras recognize the southern border of the Caucasus as passing along the border of the former USSR, i.e., not including the areas of northeastern Turkey and the northwestern part of Iran.

Each country has published multi-volume national Floras. In addition, the Euro+Med Plant Base comprises an online taxonomic resource that extends to the Caucasus for some flowering plant families, and provides extensive synonymy for widespread species.

At the same time there is no comprehensive taxonomic source for the flora of the Caucasus region as a whole as considered biogeographically within the Caucasus Biodiversity Hotspot.

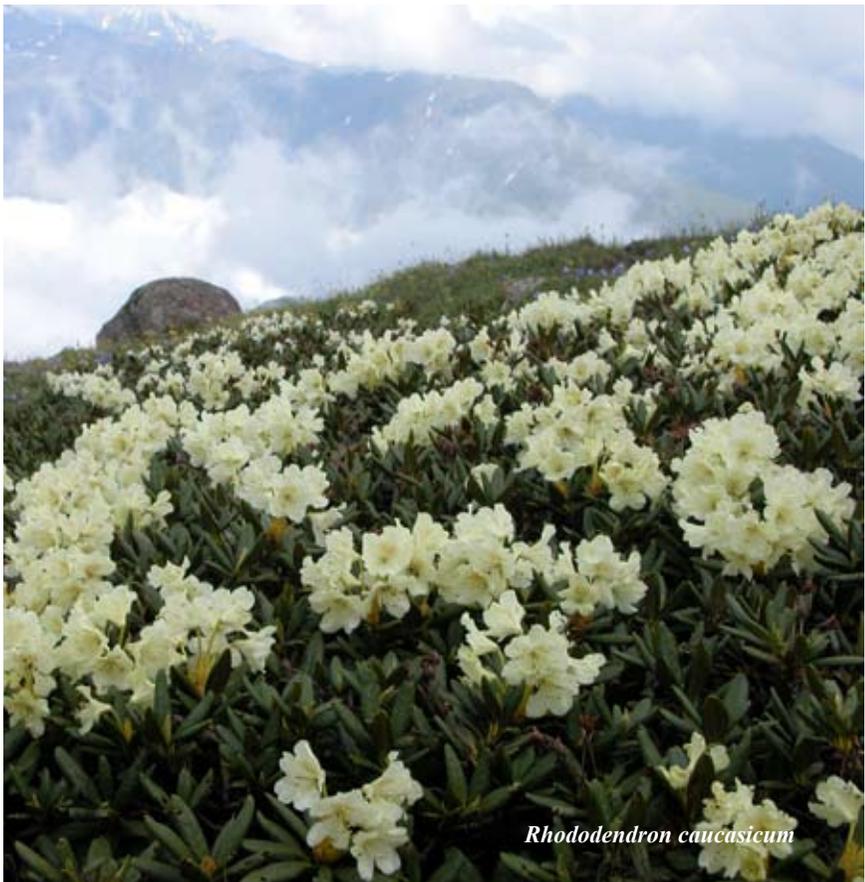
An important recent initiative has resulted in the digitization of type specimens at the Georgian National Herbarium (TBI), Institute of Botany, Iliia State University, Georgia, with support

from the Andrew W. Mellon Foundation; TBI collections include more than 1,000 type specimens. In Azerbaijan, the Baku (BAK) herbarium has commenced the databasing and digitization of the collections with support from the Volkswagen Foundation in collaboration with Berlin-Dahlem Botanical Garden and Botanical Museum (BGBM).

In the context of the Pan-Caucasian Plant Biodiversity Initiative - a collaborative network established by BGBM with partners in Armenia, Azerbaijan and Georgia, with current support from the Volkswagen Foundation, Caucasus-wide taxonomic revisions of selected plant genera (e.g. *Acantholimon*, *Campanula*, *Dianthus*, *Papaver*, *Pyrus*, *Scorzonera*) will include the databasing of collections in all major Caucasian herbaria and the development of an online portal to disseminate the results. This collaboration also addresses the need for scientific capacity building in the Caucasus countries by supporting Masters and PhD training in plant systematics.

### **Looking to the future**

- a. Compile and publish a comprehensive Flora of the Caucasus on the Internet;
- b. Digitize the types of the Caucasus plants and publish the digitized types on-line;
- c. Create a virtual gallery of the plants of the Caucasus Region on-line, including the digitization of existing slides;
- d. Launch a new wave of exploration fieldwork for discovery/re-discovery of species.



*Rhododendron caucasicum*

## **CPI Target 2: Global/regional/national assessment of the conservation status of as many known plant species of the Caucasus as possible, to guide conservation action.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**A. Plan for improving the framework conditions for achieving the goals of the ECP: Long-Term Target by 2025 A1.** Effective regional mechanisms are in place that support national actions to achieve the goals of the ECP: **Medium-Term Target by 2020 A1.2.** The countries of the Ecoregion are cooperating to develop regional species' Red Lists that complement national red lists: **Actions by 2015 A1.2.1.** Develop an Ecoregional Red List in accordance with IUCN criteria.

### **Where we are now**

"Biodiversity of the Caucasus is being lost at an alarming rate. The major threats to plant diversity in the Ecoregion are: *illegal logging, fuelwood harvesting, and the timber trade; overgrazing; infrastructure development; and pollution of rivers and wetlands.* These threats lead to habitat degradation, decline of species populations, and disruption of ecological processes – all contributing to the overall loss of biodiversity" (Williams et al. 2006).

IUCN Red List global assessments of up to 1,400 Caucasus endemic plant taxa are included in **The Red List of the Endemic Plants of the Caucasus Region** (2013). The Red List includes lists of conservation priority national endemic plant species – 50 from each of the six countries of the region. The book will be distributed to governmental and non-governmental organizations dealing with nature conservation issues in the region.

Each of the countries of the Caucasus, as well as sub-country administrative units of the Russian Federation, has its own national/sub-national Red Data Book or Red List; however, not all of the national/sub-national Red Data Books contain IUCN Red List assessments of the taxa included.

As part of the Caucasus-wide taxonomic revision of key genera, the Pan-Caucasus Plant Biodiversity Initiative is carrying out detailed studies, including field work, of the distributions of Caucasus endemics, which will lead to refined assessments of their conservation status.

### **Looking to the future**

- a. Complete global assessments of all Caucasus endemic plant taxa;
- b. Undertake regional assessments of non-endemic plant taxa;
- c. Undertake/update national assessments using IUCN Regional Guidelines, and incorporate the subsequent updates into the national Red Lists whenever needed.
- d. Identify regional conservation priority endemic as well as non-endemic plant species.

**CPI Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared throughout the Caucasus.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**A. Plan for improving the framework conditions for achieving the goals of the ECP: Long-Term Target by 2025 A1.** Effective regional mechanisms are in place that support national actions to achieve the goals of the ECP: **Medium-Term Target by 2020 A1.3.** An Ecological Network plan for the entire Caucasus Ecoregion is agreed by all the countries of the Ecoregion based on the ECP's long-term vision for biodiversity conservation. **Actions by 2015 A1.3.1.** Develop a framework for, and then elaborate, an Ecological Network plan for the entire Caucasus Ecoregion applying appropriate methodologies such as KBA and taking into account climate change tendencies according to national climate change forecasts.

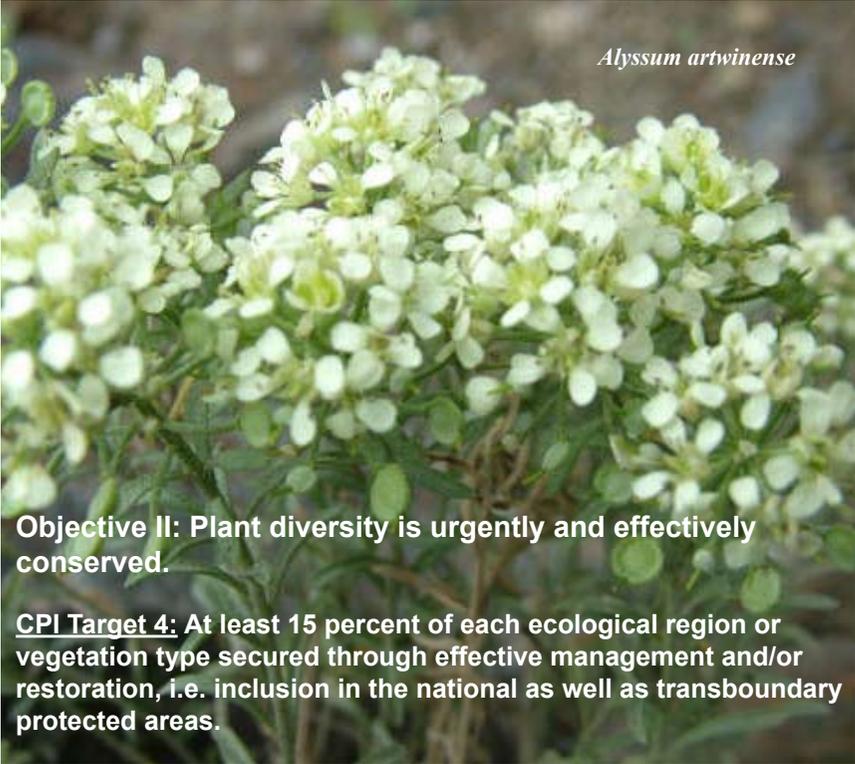
**Where we are now**

Information on plant conservation research, methodologies and practical techniques fundamental to the conservation of plant diversity is, in many cases, insufficient and not standardized.

**Looking to the future**

- a. Carry out fieldwork to monitor populations of the most threatened species to understand the nature and impact of threats using an agreed upon standard methodology throughout the region;
- b. Disseminate information to conservation practitioners throughout the Caucasus Region on the integration of in situ and ex situ conservation; reduce threats and ensure that threatened plants are maintained within ecosystems, especially in the face of changing climates; and balance increasing demands for plant-based products harvested from the wild with in situ conservation of the species that provide them.





*Alyssum artwinense*

**Objective II: Plant diversity is urgently and effectively conserved.**

**CPI Target 4: At least 15 percent of each ecological region or vegetation type secured through effective management and/or restoration, i.e. inclusion in the national as well as transboundary protected areas.**

**Relevance to the targets / actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets / actions for conservation, management and restoration of: **B. Plan for forest ecosystems. C. Plan for freshwater ecosystems. D. Plan for coastal and marine ecosystems. E. Plan for high mountain ecosystems.**

**Where we are now**

*Protected Areas*

Protected areas have played an important role in biodiversity conservation in the Caucasus for nearly a century. There are several different categories of protected areas in the region: strict nature reserves, national parks, sanctuaries, etc. Protected areas of all types currently occupy ten percent of the region (Zazanashvili et al. 2012).

WWF has been working in the Caucasus for 20 years through the WWF-Caucasus Program Office. Since 2000, WWF, in conjunction with partners from the public and scientific sectors, has been using an Ecoregional approach to coordinate and implement projects related to the establishment of new protected areas and ecological corridors, improvement in the management of existing protected areas, conservation of endangered species, and the promotion of environmental education and environmentally-sound policies. The Ecoregional Vision and **Ecoregion Conservation Plan (ECP)** was developed and published in 2006 (Williams et al., 2006).

In 2010, the Caucasus Biodiversity Council (CBC) proposed revising the ECP to take into account progress made since the previous edition. The revised edition of ECP was issued in 2012 (Zazanashvili et al. 2012).

The purpose of the ECP is to create a roadmap for conserving the rich biodiversity of the Caucasus Ecoregion. The ECP outlines a vision and long-term goals for biodiversity conservation in the Caucasus Ecoregion, which will be achieved through implementation of a concrete set of short- and medium-term actions.

According to the ECP for the Caucasus, four priority biomes – forest, freshwater, marine, and high mountains – will be the bio-geographical focus of conservation efforts, as these contain the bulk of biodiversity with the most pressing threats. Within these biomes, 56 Priority Conservation Areas (PCAs) were determined to help further target conservation efforts. The ECP includes action plans for each of the priority biomes, centered on the Priority Conservation Areas (Williams et al., 2006; Zazanashvili et al. 2012).

### *Ecosystem Services*

Protected areas perform many functions. As well as being essential for conserving biodiversity, they also deliver vital ecosystem services: Provisioning, such as the production of food and water; Regulating, such as the control of climate and disease; Supporting, such as nutrient cycles and crop pollination; Cultural, such as spiritual and recreational benefits.

An international initiative entitled **The Economics of Ecosystems and Biodiversity (TEEB) Phase III**, which mainly focuses on communications and outreach activities as well as on the expansion of the TEEB Network of experts and associations committed to biodiversity, ecosystem valuation and improved policy making, was launched upon the President's initiative in Georgia as a pilot country within the region in 2011. In 2012, UNEP supported the implementation of a TEEB Scoping study led by the WWF Caucasus Program Office and assisted by a project advisory group.

### **Looking to the future**

- a. Provide information on endemic plant species to support implementation of the Revised Ecoregional Conservation Plan for the Caucasus (draft), edited by N. Zazanashvili, M. Garforth & H. Jungius, with participation of Ch. Montalvo, WWF Caucasus, April 2012, concerning expansion and management of protected areas;
- b. Develop a guideline document on suggested actions for raising public awareness concerning the ecosystem services provided by protected areas in cooperation with the Caucasus Cooperation Center of IUCN.



*Salix rizeensis*



**CPI Target 5: At least 75 percent of the most important areas for plant diversity of the Caucasus protected, with effective management in place for conserving plants and their genetic diversity.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **B. Plan for forest ecosystems. C. Plan for freshwater ecosystems. D. Plan for coastal and marine ecosystems. E. Plan for high mountain ecosystems. F. Plan for priority species: Long-Term Target by 2025 F1. Populations of all priority species are increased and/or stabilized: Medium-Term Target by 2020 F1.1.** Regional working groups on priority species are functioning and connected to relevant working groups under the IUCN/SSC: **Actions by 2015: F1.1.6.** Establish regional Plant Working Group and identify priority species and invasive species to be controlled; **F1.1.7.** Support seminars for working groups on conservation of priority species and ensure expert input from the IUCN/SSC.

#### **Where we are now**

Identification of Important Plant Areas (IPAs), natural or semi-natural sites exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species, and/or vegetation of high botanical value was conducted in Armenia, and initiated in Georgia, within the framework of the project **Coordination and Development of Plant Red list Assessments for the Caucasus Biodiversity Hotspot.**

#### **Looking to the future**

- a. Complete identification of IPAs throughout the Caucasus Region by 2015; analysis of the distributions of the species in key Caucasian genera with updated taxonomic frameworks resulting from the Pan-Caucasus Plant Biodiversity Initiative can serve as the basis for identifying important centers of endemism.
- b. Develop a plan for the creation of a network of plant micro-reserves throughout the Caucasus region, and solicit their establishment from national governments.



**CPI Target 6: At least 75 percent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **B. Plan for forest ecosystems: Long-Term Targets by 2025: B5.** Forests are managed effectively, management policies and practices take account of the potential impact of climate change, illegal logging is eliminated and conservation of biodiversity is taken into account in forestry practices; **B6.** Forest certification is established and functioning in the Caucasus Ecoregion according to international standards; **B7.** Traditional rights to use forest resources are respected; **B8.** Forests are resilient to the expected impacts of climate change. **C. Plan for freshwater ecosystems: Long-Term Target by 2025 C4.** Rivers and/or lake catchment areas in the Ecoregion are protected and managed sustainably taking into account the impacts of climate change. **E. Plan for high mountain ecosystems: Long-Term Target by 2025 E3.** Sustainable pastureland management is practiced in high mountain habitats and conservation of biodiversity is taken into account.

**Where we are now**

Concepts and strategies for the sustainable management of production land, i.e. the use of the resources, such as soils, water and plants, for the production of goods to meet human needs, while assuring the long-term productive potential of these resources, need to be developed in the Caucasus Region.

**Looking to the future**

- a. Identify indigenous Caucasus Region plant species occurring within and associated with production lands;
- b. Define concepts related to the sustainable management of production lands, and develop management plans consistent with the conservation of plant diversity.



**CPI Target 7: At least 75 percent of known threatened plant species conserved *in situ*.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**F. Plan for priority species: Long-Term Target by 2025 F1.** Populations of all priority species are increased and/or stabilized: **Medium-Term Target by 2020 F1.1.** Regional working groups on priority species are functioning and connected to relevant working groups under the IUCN/SSC: **Actions by 2015: F1.1.6.** Establish regional Plant Working Group and identify priority species and invasive species to be controlled; **F1.1.7.** Support seminars for working groups on conservation of priority species and ensure expert input from the IUCN/SSC.

**Where we are now**

Knowledge of the presence of threatened species within protected areas is insufficient at the present time.

**Looking to the future**

- a. Carry out GAP analysis of threatened species with respect to presence in protected areas;
- b. Gather scientific information (population sizes and locations, genetic studies, etc.) to be used in the development and implementation of protection, management or recovery plans;
- c. Increase public awareness and knowledge of threatened plant species present within protected areas, together with the establishment of partnerships with relevant stakeholders at the local level for monitoring threatened plant species within protected areas.



*Galanthus platyphyllus*

**CPI Target 8: At least 75 percent of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programs.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**F. Plan for priority species: Long-Term Target by 2025 F1.** Populations of all priority species are increased and/or stabilized: **Medium-Term Target by 2020 F1.1.** Regional working groups on priority species are functioning and connected to relevant working groups under the IUCN/SSC: **Actions by 2015: F1.1.6.** Establish regional Plant Working Group and identify priority species and invasive species to be controlled; **F1.1.7.** Support seminars for working groups on conservation of priority species and ensure expert input from the IUCN/SSC.

**Where we are now**

**Botanical gardens** in the region maintain living collections of many endemic as well as rare non-endemic species of plants.

**The Millennium Seed Bank Partnership ‘Saving the Flora of the Caucasus Program’** is bringing together seed banks and botanic gardens across the region to facilitate the *ex situ* conservation of the flora of the region. All seed collections, together with associated herbarium specimens and field data are conserved at the partner organizations in the country of origin, with duplicates conserved at the Royal Botanic Gardens Kew, UK. Training and technical support is provided by RBG Kew in all aspects of species targeting, seed collecting, seed processing and banking, germination testing, propagation and databasing. In Georgia, the National Botanic Garden houses around 1,000 species in the **Caucasus Regional Seed Bank**, which was initially established in 2004 in collaboration with the Missouri Botanical Garden, USA. In Armenia, around 100 species are conserved in the seed bank at the Institute of Botany, Armenian National Academy of Sciences. In Azerbaijan, the **National GeneBank of the Azerbaijan Republic on Plant Genetic Resources** was established in 2004 with the support of the World Bank. Seed stocks of 600 species are stored in the GeneBank. Seeds of endemic species of local flora will be collected by the Institute of Botany and the Institute of Genetic Resources of Azerbaijan National Academy of Sciences within the framework of the Azerbaijan Wild Species Collecting project for *ex-situ* conservation in the National GeneBank of the Azerbaijan Republic on Plant Genetic Resources, and Millennium Seed Bank, Royal Botanic Gardens, Kew, UK 2013-2015.

A workshop on the **Role of Botanic Gardens in Georgia: Opportunities and Challenges for the Future, organized by Botanic Gardens Conservation International (BGCI)** and Tbilisi Botanical Garden and Institute of Botany, was held on 21-22 May, 2009. The goals of the workshop, which are applicable to botanic gardens throughout the Caucasus region, were to: a) Discuss the main challenges of Georgian botanic gardens in conservation, research, education, and public outreach; b) enhance relationships and exchanges within the Georgian botanic garden community; and c) strengthen linkages with BGCI and other national and international partners, exploring potential areas of future support and collaboration. An overview of botanical gardens in Armenia was also presented at the workshop.

**Looking to the future**

- a. Encourage seed banking activities throughout the Caucasus region;
- b. Establish a regional electronic database of *ex situ* plant conservation activities undertaken by botanical gardens in the Caucasus region, documenting the presence, status, and recovery plans for threatened plant species in the Caucasus region.



**CPI Target 9: 70 percent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.**

**Where we are now**

Stocks of local agrobiodiversity germplasm are currently stored both in the Caucasus countries and abroad. However, no estimate of their percentage relative to the total regional agrobiodiversity is available.

A number of organizations promoting the development of sustainable organic farming and dedicated to increasing the self-reliance of the rural population also function in the region.

Research on crop wild relatives has been conducted in Armenia in conjunction with Bioversity International, and should be extended to other countries in the Caucasus region.

The existing resources and exploitation rates of other socio-economically valuable plant species are still to be evaluated.

**Looking to the future**

- a. Ensure proper maintenance of the existing stocks of local agrobiodiversity germplasm at the national level wherever relevant.
- b. Create a national/regional electronic database(s) of available knowledge on crop diversity, crop wild relatives and other socio-economically valuable plant species as well as conservation measures undertaken to preserve them.
- c. Develop plans for further conservation measures for crop diversity, crop wild relatives and other socio-economically valuable plant species.
- d. Increase public awareness on the importance of maintaining local cultivars in the region's agricultural systems as a means of ensuring food security in the future.

## **CPI Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

**F. Plan for priority species: Long-Term Target by 2025 F1.** Populations of all priority species are increased and/or stabilized: **Medium-Term Target by 2020 F1.1.** Regional working groups on priority species are functioning and connected to relevant working groups under the IUCN/SSC: **Actions by 2015 F1.1.6.** Establish regional Plant Working Group and identify priority species and invasive species to be controlled.

### **Where we are now**

The alien flora of the Caucasus region is insufficiently studied.

“The Alien Flora of Georgia” was published by Kikodze et al. in 2010 as a result of a joint research project between Georgia and Switzerland, whose aim was to survey the alien plants of Georgia in expected sensitive habitats across all accessible historical-geographical regions of Georgia.

“Current knowledge clearly indicates that invasive plants will deteriorate some of the unique natural ecosystems of the country and pose threats to the indigenous species diversity, agriculture and human health. Additional intensive research activities are necessary to better understand the role of alien species and elaborate both preventative (legislation, regulations such as limited trade, border controls, etc.) and curative control measures (chemical, mechanical, biological as well as their integrated combination) in order to mitigate further spread of alien plant species, and thus reduce the predicted high ecological and economic losses imposed by alien and invasive plant species” (Kikodze et al. in 2010).

Kikodze, D., Memiadze, N., Kharazishvili, D., Manvelidze, Z. & Mueller-Schaerer, H. 2010. The Alien Flora of Georgia. Tbilisi.

### **Looking to the future**

- a. Produce regional and national inventories of invasive alien plant species.
- b. Organize a symposium on invasive plants in the Caucasus region.
- c. Promote the use of native species in gardening and landscape design work, emphasizing the selection of non-invasive ornamentals.



*Hyrcanian forest*



**CPI Objective III: Plant diversity is used in a sustainable and equitable manner.**

**CPI Target 11: No species of wild flora endangered by international trade.**

**Relevance to the targets / actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **A. Plan for improving the framework conditions for achieving the goals of the ECP: Long-Term Target by 2025 A3.** Capacity exists in all of the countries of the Ecoregion to achieve the goals of the ECP: **Medium-Term Target by 2020 A3.2.** Institutional capacity to halt poaching and illegal trade in wildlife and natural resources is strengthened.

**Where we are now**

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) has been in force for over 30 years and has been ratified by over 170 countries, including all six countries of the Caucasus region. However, the magnitude of international trade in wild flora from the Caucasus region is unspecified and needs to be updated and quantified, and implementation of the convention improved within the region.

The Eighth European regional CITES plants meeting was held in Tbilisi, Georgia, from 19 to 22 September, 2011. The recommendations from the meeting should be considered in all the activities linked to this target.

**Looking to the future**

- a. Investigate the status of international trade in wild flora from the Caucasus region;
- b. Build capacity within the Caucasus region to strengthen CITES enforcement of trade in endangered geophytes.
- c. Develop national legislation to mandate the registration of botanical collections for CITES in all countries of the region.

## **CPI Target 12: All wild-harvested plant-based products sourced sustainably.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **B. Plan for forest ecosystems: Long-Term Targets by 2025: B5.** Forests are managed effectively, management policies and practices take account of the potential impact of climate change, illegal logging is eliminated and conservation of biodiversity is taken into account in forestry practices. **E. Plan for high mountain ecosystems: Long-Term Target by 2025 E4.** Medicinal and other economically important wild plants occupy a stable place in markets in the Ecoregion, having been harvested sustainably in high mountain areas.

### **Where we are now**

Plants harvested directly from the wild are of great importance in rural areas of the Caucasus, providing food, fuel, timber and medicines. Unregulated collection of economically useful plants has the potential to endanger the survival of many plant species. However, knowledge on the existing resources and harvest rates of wild economically valuable plants in the region is currently insufficient to ensure sustainable harvest.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and its partner, The Institute of Marketology (IMO), supported the governments of Armenia, Azerbaijan and Georgia in implementing the program "Sustainable management of Biodiversity" financed by the German government.

### **Looking to the future**

- a. Investigate existing resources and harvest rates of wild economically useful plants in the Caucasus region, and provide recommendations for the adoption of laws to regulate their sustainable harvest.
- b. Establish suitable national certification schemes and provide training to local collectors, as well as small and medium-sized companies.





*Picea orientalis in northeastern Turkey*

**CPI Target 13: Indigenous and local knowledge, innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.**

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) for the Caucasus (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **E. Plan for high mountain ecosystems: Long-Term Target by 2025 E3.** Sustainable pastureland management is practiced in high mountain habitats and conservation of biodiversity is taken into account.

**Where we are now**

Plants have been used by the people of the Caucasus region for thousands of years. Information on traditional uses of plants in the region are scattered throughout the literature on medicinal plants, crop science, etc. However, substantial new research is urgently needed to gather indigenous knowledge held only by the older generation.

**Looking to the future**

Initiate ethnobotanical investigations in the region to gather, preserve and maintain indigenous and local knowledge associated with plant resources.

**Objective IV: Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted.**

**CPI Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programs.**

**Relevance to the targets / actions of the Ecoregion Conservation Plan (ECP) (Zazanashvili et al. 2012):**

Targets / actions for conservation, management and restoration of: **A. Plan for improving the framework conditions for achieving the goals of the ECP: Long-Term Target by 2025 A7.** Regional research, information, and learning centers work to increase and transfer knowledge of biodiversity issues in the Ecoregion.

**Where we are now**

“Surveys have shown that there is a low level of recognition among the general public of the term ‘biodiversity’ and more specifically, a lack of understanding of the important role that plants play in supporting human well-being.”

A consultation on how well plants are included in education programs has been carried out by BGCI in six countries (Brazil, China, Indonesia, Russia, UK and USA). Similar issues were identified across the countries, in particular:

- over-emphasis on animals and neglect of plants in environmental education programs;
- the need for increased teacher training relative to plant diversity;
- a lack of opportunity for children to experience nature first-hand;
- plant conservation messages being masked by an overwhelming level of advertising in all media.

Guide to the GSPC. Compiled by Suzanne Sharrock. Published by Botanic Gardens Conservation International. January 2012. Retrieved from: [http://www.plants2020.net/files/~Plants2020/popular\\_guide/englishguide.pdf](http://www.plants2020.net/files/~Plants2020/popular_guide/englishguide.pdf)

An exhibition on the plant diversity of the Caucasus is being prepared in collaboration with the Berlin-Dahlem Botanical Garden as part of the project “Developing Tools for Conserving the Plant Diversity of the Transcaucasus” with support from Volkswagen Foundation. Aimed at increasing public awareness, the exhibition will travel to botanical gardens in Tbilisi, Baku and Yerevan throughout 2014.

**Looking to the future**

- a. Exchange educational materials and success stories within the region that promote plant conservation;
- b. Engage stakeholders responsible for putting the knowledge into practice;
- c. Establish curricula in conservation biology at primary, secondary, and university levels.



**Objective V: The capacities and public engagement necessary to implement the Strategy have been developed.**

*Hibiscus ponticus*

**Relevance to the targets/actions of the Ecoregion Conservation Plan (ECP) (Zazanashvili et al. 2012):**

Targets/actions for conservation, management and restoration of: **A. Plan for improving the framework conditions for achieving the goals of the ECP: Long-Term Targets by 2025: A1.** Effective regional mechanisms are in place that support national actions to achieve the goals of the ECP; **A2.** The goals of the ECP are supported by effective national policies and legal frameworks; **A3.** Capacity exists in all of the countries of the Ecoregion to achieve the goals of the ECP; **A4.** All of the PAs in the Ecoregion are effectively managed; **A5.** Nature-based tourism provides income to support the PA system and local communities; **A6.** International recognition supports improvement of PA management.

**CPI Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.**

**Where we are now**

“The plant sciences are often taught less in schools than other sciences, which contributes to a chain of events involving reduced research, reduced funding, fewer students studying botany at a higher level, and fewer universities offering courses in plant science.”

“The expert workforce is ageing while the number of students being trained in taxonomy shrinks.”

Guide to the GSPC. Compiled by Suzanne Sharrock. Published by Botanic Gardens Conservation International. January 2012. Retrieved from: [http://www.plants2020.net/files/~Plants2020/popular\\_guide/englishguide.pdf](http://www.plants2020.net/files/~Plants2020/popular_guide/englishguide.pdf)

The **Millennium Seed Bank Partnership ‘Saving the Flora of the Caucasus Program’** is striving to increase the number of trained people with appropriate skills to carry out *ex situ* conservation of the Caucasus flora. Areas of training include: theory and practice of seed collection, processing and banking; germination testing; propagation of priority species; taxonomy, databasing, and Red Listing. To date, over 20 people have been trained, and the facilities at partner organizations have been upgraded.

The **Berlin-Dahlem Botanical Garden ‘Pan-Caucasian Plant Diversity Initiative’** has established a long-term institutional partnership with the major botanic gardens and herbaria in Armenia, Azerbaijan and Georgia, which builds upon historical connections dating back

before Soviet times. As part of this initiative, funding has been obtained from Volkswagen Foundation for the project “Developing Tools for Conserving the Plant Diversity of the Transcaucasus” (2012-2014). The project is providing support for the training of four PhD students from the Caucasus in the field of plant diversity analysis.

### **Looking to the future**

Incorporate measures directed toward increasing the number of trained people in botany and plant conservation into National Biodiversity Strategies and Action Plans (NBSAPs), taking into account the concepts described in the Guide to the Global Taxonomy Initiative (GTI) (<http://www.cbd.int/doc/publications/cbd-ts-30.pdf>) developed by the Secretariat of Convention on Biological Diversity (CBD).

### **CPI Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.**

#### **Where we are now**

The **Caucasus Plant Red List Authority** was established under the auspices of the IUCN Species Survival Commission within the framework of the Caucasus endemic plant Red Listing project in 2007. The RLA has 45 members.

The **Millennium Seed Bank Partnership ‘Saving the Flora of the Caucasus Program’** is working with organizations in the region to facilitate coordinated *ex-situ* conservation of the flora of the region.

The **Berlin-Dahlem Botanical Garden ‘Pan-Caucasian Plant Diversity Initiative’** has started to build a network of institutions engaged in plant conservation and research in the Caucasus and also internationally. The initiative will facilitate the exchange of data, personnel, and materials and will support capacity building in various aspects. A primary goal of the network is to better integrate Caucasian scientists and institutions into global activities. Support currently comes from the Volkswagen Foundation (through 2014), and further grant opportunities will be sought.

### **Looking to the future**

- a. With the Caucasus Plant RLA at its core, establish a Caucasus regional plant conservation society to include amateurs and business partners;
- b. Coordinate efforts with the IUCN Caucasus Cooperation Center and national governments.



*Dianthus seidlitzii*



In October 2009 scientists from the Missouri Botanical Garden, Armenia, Azerbaijan, Georgia, Iran, Russia, and Turkey met for the first time at the Missouri Botanical Garden in Saint Louis, Missouri, to discuss and prepare the data and documents for the Red Book of the Endemic Plants of the Caucasus.



*Pinus eldarica*



*Lilium ledebourii*



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