SCIENTIFIC PROGRAMS OFFERED BY THE CONSERVATORY

PURPOSE:

One of the primary aims of the Botanical Research Department at the Conservatory in Cedar Rock, is to advance knowledge of the plant world through botanical, horticultural, permacultural and conservation programs.

This is achieved through presentation of living plant collections and rotating displays in the Courtyard and the distinct Pavilions, as well as through the wide range of botanical garden themes including plant geography, landscapes, ecology, biodiversity, taxonomy and classification, biology, ethnobotany, economic botany, and landscape design.

All activities and programs throughout the Conservatory are coordinated and facilitated by knowledgeable staff, and specialized expertise provides visitors and guests with the most up to date information.

Partnerships with external groups at a national and international level, including botanic gardens, universities, and other research institutions, ensure that research undertaken in Cedar Rock is focused on restoring and rehabilitating degraded environments.

PROGRAMS & ACTIVITIES:

The Principal programs and activities offered at Cedar Rock's Conservatory are centered on the following:

Collections Documentation:

Collections Documentation provides a complete and accurate scientific record of the origin of all plant material included in the collections and rotating displays; propagation records and destinations within each collection.

Living Collections & Displays Policy and Collections Development:

The acquisition of plant material meticulously follows the guidelines established through a Living Collections Policy and Accessions Policy, to ensure no invasive species are brought into the area, and that the health of every plant is maintained.

Germplasm Research and Micropropagation:

Identification and protection of threatened plant species, viability testing procedures, and research into the development of long term storage protocols is ongoing.

THE SUSTAINABLE LANDSCAPE PROJECT

The Sustainable Landscapes Project is aimed at demonstrating and promoting appropriate park and garden design, plant species selections and sustainable horticultural and permacultural practices, with effective, efficient and appropriate water use for southern British Columbia's landscapes.

Poisonous/Harmful Plants Consultancy:

The Conservatory's Scientific Services Staff provide advice and primary consultancy to the general public and surrounding educational, medical and social centers on issues relating to poisonous and harmful plants. This includes assistance with accurate identification and determination of the possible effects of plant materials.

Affiliated Partners:

Cedar Rock's Conservatory is continually working towards partnering with government and private agencies and organizations who share the same dedicated passion to environmentally responsible practices that will preserve, maintain, and enhance ecological areas and promote life-long learning in the areas of botany, horticulture, permaculture, and ecology.

Plants Alive Selector:

This initiative has been designed to provide information on suitable plants species that can be used in gardens throughout the diverse regions of British Columbia.

Selection Criteria: The focus is on species that have low water requirements once established and that are non-invasive in the areas for which they are being recommended. All selected species include plants that are indigenous to the specified area, native to another part of Canada. Introduction of plants from other countries is minimized.

Water Requirements: Each established plant is assessed for it's supplementary water consumption during dry periods/extended periods without rain, and during summer months. Plants are indicated as having either a minimal or moderate water requirement. Plants that require regular supplementary water once established are not included.

Plant Information: Detailed information is provided regarding each plant's soil, light preferences, physical appearance, growth habits, attraction for native fauna, common landscaping uses and other qualities and cautions.

Local Environmental Conditions: It is very important to select plants that will suit the environmental conditions of each specific planting location. The conditions that need to be considered include soil type and modification(s), aspect, drainage, fire risk, rain and snowfall patterns, temperatures, wind, sun exposure, and frost.

Availability: The majority of plants made available commercially at plant nurseries and/or growers usually need sufficient lead time for preferred species and numbers to be made available. Less commonly used species may prove to be even more difficult to source. The Plant Selector provides information on the best times to consider purchasing plant material.

Permits: In British Columbia, the collection or harvest of certain plant material or seeds from native plant species may be required. The Plant Selector provides information on plants that may require permits.

Genetic Implications: Certain circumstances may arise where plant identification is essential – as when planting near to natural reserves or parks – to ensure that there is a reduced risk of plant hybridizing with local species. The expert advice made available through the Plant Selector identifies species that may pose potential threat to adjacent natural vegetation communities.

CONSERVATION BIOLOGY RESEARCH

In British Columbia, there are a number of plant species that are considered to be under some degree of threat in the wild. Unless appropriate remedial action is taken, many of these threatened species could be at risk of becoming extinct within our lifetimes. Conservation management is particularly challenging in the Province because these species are so diverse, and the threats to their survival just as varied.

In order to implement sound management decisions to ensure their future sustainability, the need to develop basic knowledge about these plants and the reasons for their endangerment is urgently needed.

Studies undertaken at Cedar Rock's Conservatory Research Centre focus on improving our understanding of the biology and ecology of the threatened flora of British Columbia, so that recovery and management plans for these species are based on accurate scientific information.

Conservation Research:

Much of the research at Cedar Rock is focused on delineation of the threats to a species' ongoing sustainability, and how these may be overcome to improve population management.

*Reproductive biology, seed bank dynamics tell us whether factors associated with fecundity or seed dispersal are limiting the presence of the next generation of a plant species.

*Responses of threatened species to fire inform us about regeneration mechanisms and what are considered safe fire frequencies for each plant species.

*Genetic studies reveal the issues associated with cloning or inbreeding in small populations.

Plant Translocation:

In some cases, where the deliberate transfer of plants from on existing site to a new location in the wild may be required to augment existing populations of endangered plant species, extreme care must be taken in constructing new populations.

Trial translocations can be a useful tool for refining procedural and technical details prior to large scale translocations, and studies on propagation physiology may also form part of this research.

Target Species:

The plants targeted for research at Cedar Rock's Conservatory represent some of the Province's most critically endangered species. By analyzing these individual plants, and their predators, recommendations for preservation, micropropagation, site management and assessment of potential consequences of mixing different populations together, can lead to the sustainability of these and other plants for future generations.

Seed Conservation & Collection:

In order to reduce the rapid loss of plant biodiversity, Cedar Rock's Conservatory implements efficient conservation strategies wherever possible. One of the key activities at the Conservatory is to undertake seed collections of priority plant species for the establishment of long-term seed conservation collections and the development of seed germination and storage protocols for collected species.

Once a target species has been identified in the field, seeds are harvested in a manner that ensures a genetic representation of the population is collected. No more than 10% of available threatened species seeds are collected, thus ensuring the long-term impact of seed collection on wild plant populations is minimal. Sufficient seeds are collected however whenever possible, as routine viability and germination trials use up a proportion of the collection's stock. It is hoped that this program will contributed to our knowledge of the flora in British Columbia.

Seed Processing & Storage:

Seeds are placed in a specialized drying room to ensure slow steady drying and minimize reductions in seed lot viability. Seeds are then cleaned to remove debris and foreign materials. Once dried, they are hermetically sealed and can potentially be stored for over 100 years. Viability testing is done one year after being initially stored, and subsequently tested every five years.

Seed Biology Research & Alternative Conservation Techniques:

Research is directed to the understanding of dormancy mechanisms and the development of seed germination methodologies with those native plant species that are difficult to grow from seed. In some cases, seeds from a particular plant species may not be suitable for long-term storage, and limitations to population size may prevent sufficient seed collection from wild populations. It is under such circumstances that alternative conservation techniques including tissue culture based methodology of micropropagation and embryo culturing may be adopted.

Student Research Projects:

A variety of opportunities are available to students – ranging from small projects, suitable for incorporation into undergraduate studies, to more extensive projects suitable for a post-graduate level.

Projects are focused on understanding and keeping track of the diversity of native Canadian plants. The goal is reduce the vulnerability of Canadian flora to invasive species, extinctions, poor environmental policy, and improve our country's ability to respond and adapt to global changes.

For further information about student research projects, please contact Cedar Rock's Conservatory.

Tackling Climate Change:

The Earth's climate is one of the least predictable and potentially the most disruptive alteration facing all living organisms. It is now indisputable that human-induced climate change is contributing to the large-scale biodiversity loss that is occurring globally.

In particular, the cumulative effect of (micro) climatic changes is causing dramatic shifts in species distributions and species extinctions, not just across fragmented or vulnerable ecosystems – but in all of our own backyards.

Combating the risks associated with climate change is a major challenge facing all communities, and Cedar Rock is dedicated to understanding the potential impact climate change has on threatened plant species, and to developing, maintaining, and sharing information and sustainable preservation solutions.