

*Investing
in Nature*

A Partnership for Plants in Canada
Un partenariat canadien pour les plantes

Canadian Botanical Gardens Conservation and Education Summary of Status and Needs

Based on consultations conducted April to October 2003

March 2004
Laurel McIvor



Canadian Botanical
Conservation Network
le réseau canadien pour
la conservation de la flore

JARDIN BOTANIQUE
DE MONTRÉAL



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Executive Summary

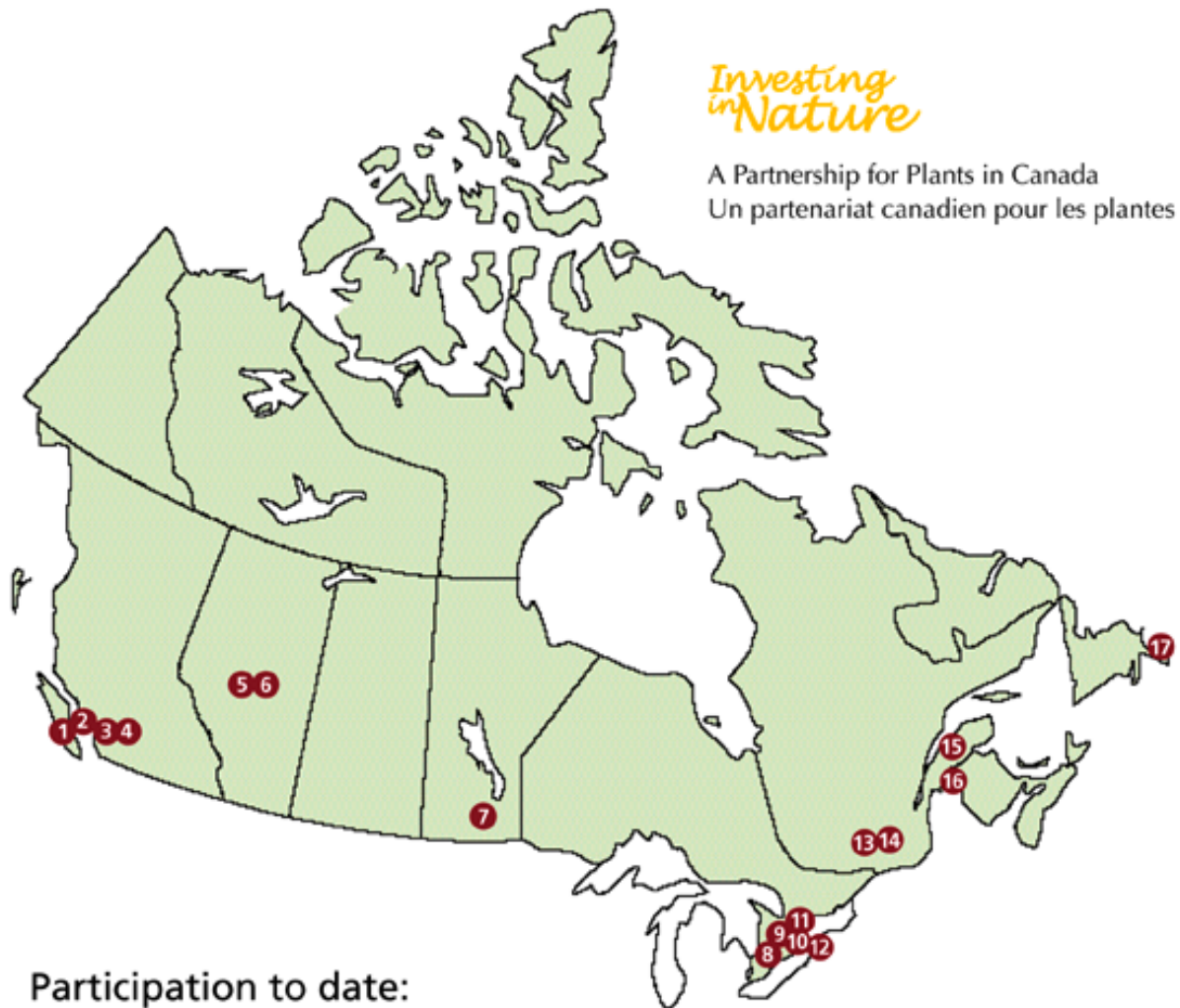
The Investing in Nature: A Partnership for Plants in Canada project has been greeted with enthusiastic support and genuine interest in increasing conservation efforts. Currently, the 17 Canadian botanical gardens and arboreta consulted house approximately 45 000 living plant species and 1 253 000 herbarium specimens. Activities at these gardens contribute to horticultural, ethnobotanical and taxonomic research, plant inventories, floristics, habitat restoration, in situ and ex situ conservation. In addition, these gardens are actively involved in the conservation of 18 nationally listed species at risk and over 100 provincially listed species.

In above and beyond the research efforts, these primarily urban-based institutions are important recreation, tourism and education destinations. As such, they play an important role in public education and awareness about the function and importance of plants, their role in ecosystems, conservation and sustainable use/ gardening practices. Collectively they host about 4.5 million visitors a year, and deliver educational programs to approximately 300,000 people.

The co-operation and interest demonstrated are further indications that collectively, botanical gardens and arboreta in Canada and worldwide can make significant contributions to the conservation of international biodiversity.

Participation:

As with many partnerships, the success of this project depends on the participation and feedback of all of our partners. I would like to extend my gratitude to the following institutions for their time and input:



Participation to date:

1. Tofino Botanical Gardens, Tofino, British Columbia
2. Milner Gardens and Woodland, Qualicum Beach, British Columbia
3. University of British Columbia Botanical Garden, Vancouver, British Columbia
4. VanDusen Botanical Garden, Vancouver, British Columbia
5. University of Alberta Devonian Botanical Garden, Edmonton, Alberta
6. Muttart Conservatory, Edmonton, Alberta
7. Assiniboine Park Conservatory, Winnipeg, Manitoba
8. University of Western Ontario Sherwood Fox Arboretum, London, Ontario
9. The Arboretum, University of Guelph, Guelph, Ontario
10. Royal Botanical Gardens, Hamilton, Ontario
11. Toronto Zoo, Toronto, Ontario
12. Niagara Parks Botanical Gardens and School of Horticulture, Niagara Falls, Ontario
13. Morgan Arboretum, Ste-Anne-de-Bellevue, Quebec
14. Montreal Botanical Garden, Montreal, Quebec
15. Reford Garden, Mont-Joli, Quebec
16. New Brunswick Botanical Garden, St. Jacques, New Brunswick
17. Memorial University of Newfoundland Botanical Garden, St. John's, Newfoundland

As of November 2003

Introduction

Conservation research and educational programming differs considerably at botanical gardens and arboreta across Canada. While there are between 70 and 100 Canadian facilities that maintain plant collections and are open to the public, not all of these have educational programmes, a scientific basis for the collections or thorough documentation. Of those institutions that could be classified as botanical gardens or arboreta, most are small, seasonal operations. Some are associated with universities, some publicly administered, and a few are privately owned. While we do not have our own national botanical gardens association, the Canadian Botanical Conservation Network works directly with botanical gardens, arboreta and related organisations, individuals and others to increase their participation in plant conservation and biodiversity programs.

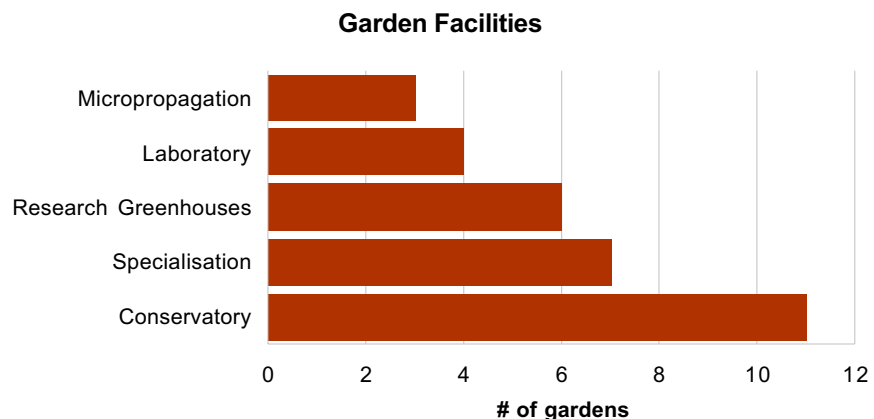
To better understand the operations and circumstances of various botanical garden/ arboreta, I began investigating what types of plant conservation efforts and biodiversity education programmes are currently conducted by these institutions. Between April and October 2003, I have visited and/ or communicated with professional botanists, educators, administrators and volunteers at various Canadian botanical gardens and arboreta. In addition to introducing the *International Agenda for Botanic Gardens in Conservation* and its application, we discussed what information, educational resources, training and networking are needed to enhance plant conservation education. While each institution is indeed quite unique, I have discovered some common issues and needs and collected a number of valuable suggestions to address through the “Partnership for Plants in Canada” project.

Summary of Consultations

Section A: Current Conservation and Education Programmes

1. Garden facilities:

Gardens identified the types of facilities that applied to their institutions. Several gardens had a number of special collections and didn't always include an exhaustive list.



2. Garden Collections:

The following collections were identified during discussions, from literature, from individual web sites, and personal communication. It is not intended as a complete list, just an overall look at specialisation and collections of interest.

Institution	Main collections of research/ horticultural interest:	Theme Garden Areas / Natural Habitats
The Arboretum, University of Guelph	Anacardiaceae, Betulaceae, Caprifoliaceae, Cornus, Ericaceae, Juglandaceae, Fabaceae, Fagaceae, Oleaceae, Paeoniaceae, Rosaceae, Rutaceae, Sapindaceae, Saxifragaceae	<ul style="list-style-type: none"> • English, Italian, Japanese, World of Trees, Memorial Forest, Ontario Trees & Shrubs, Wildlife • Carolinian Forest, wetland, meadow
Assiniboine Park Conservatory	Arecacea, Orchidaceae, & arid collections	<ul style="list-style-type: none"> • Conservatories: Arid, Tropical • Plants of Manitoba • Bonsai Collection
Devonian Botanic Garden	Alliaceae, Asteraceae, Berberidaceae, Betulaceae, Boraginaceae, Cactaceae, Campanulaceae, Caprifoliaceae, Caryophyllaceae, Cornaceae, Cruciferae, Cycadaceae, Ericaceae (including Rhododendron), Eupobiaceae, Fabaceae, Fagaceae, Gentianaceae, Geraniaceae, Iridaceae, Juniperus, Lamiaceae, Leguminosae, Liliaceae, Onagraceae, Orchidaceae, Paeoniaceae, Papaveraceae, Pinaceae, Polemoniaceae, Polygonaceae, Primulaceae, Ranunculaceae, Rosaceae, Rutaceae, Salicaceae, Saxifragaceae, Scrophulariaceae, Tiliaceae, Violaceae	<ul style="list-style-type: none"> • Alpine, Arboretum Berry patch, Desert, Herbs, Native Peoples', Japanese, Lilac, Native Plants of Alberta, Primula and Iris Dells, Rheum Collection, Rose, Pinetum, Sensory and Healing Garden • Conservatories: Tropical, Butterfly, Cacti, Succulents, Plants & People; Orchids, Blue and white gardens • Habitats: Wetland, Pine Forest, Sloughs and Ponds
Memorial University of Newfoundland Botanical Garden	Caryophyllaceae, Cupressaceae, Ericaceae, Gentianaceae, Geraniaceae, Iridaceae, Liliaceae, Primulaceae, Rhododendron, Pinaceae, Polemoniaceae, Primulaceae, Saxifragaceae, Crassulaceae	<ul style="list-style-type: none"> • Alpine House, Dried Flower, Heritage, Medicinal, Native Plants of the Northeast, Rock, Shade, Vegetable, Wildlife • Boreal Forest, Bog, Fen
Milner Gardens and Woodland	Betulaceae, Ericaceae, Fagaceae, Rosaceae, Sapindaceae, Saxifragaceae	<ul style="list-style-type: none"> • Berry, Medicinal Herbs, Vegetable • Old-growth Coastal Douglas Fir Forest, meadow-lawn
Montreal Botanical Garden	Aceraceae, Agavaceae, Aizoaceae, Alliaceae, Amaryllidaceae, Apiaceae, Araceae, Asteraceae, Begoniaceae, Betulaceae, Boraginaceae, Brassicaceae, Bromeliaceae, Cactaceae, Campanulaceae, Caprifoliaceae, Caryophyllaceae, Crassulaceae, Cucurbitaceae, Cupressaceae, Cyperaceae, Dryopteridaceae, Ericaceae, Euphorbiaceae, Fabaceae, Gentianaceae, Geraniaceae, Gesneriaceae, Hydrangeaceae, Iridaceae, Lamiaceae, Liliaceae, Malvaceae, Oleaceae, Orchidaceae, Paeoniaceae, Papaveraceae, Pinaceae, Poaceae, Polemoniaceae, Primulaceae, Ranunculaceae, Rosaceae, Salicaceae, Saxifragaceae, Scrophulariaceae, Solanaceae	<ul style="list-style-type: none"> • Alpine, Arboretum, Chinese, Economic Plants, Exhibition, Experimental, First Nations, Innovations, Japanese, Rose, Sensory, Shade, Turkish, Youth • Wetlands, Hardwood, Softwood, Mixed and Laurentian Forests • Conservatories: Arid, Begonias & Gesneriads, Ferns, Orchids & Aroids, Bonsai & Penjing, Tropical

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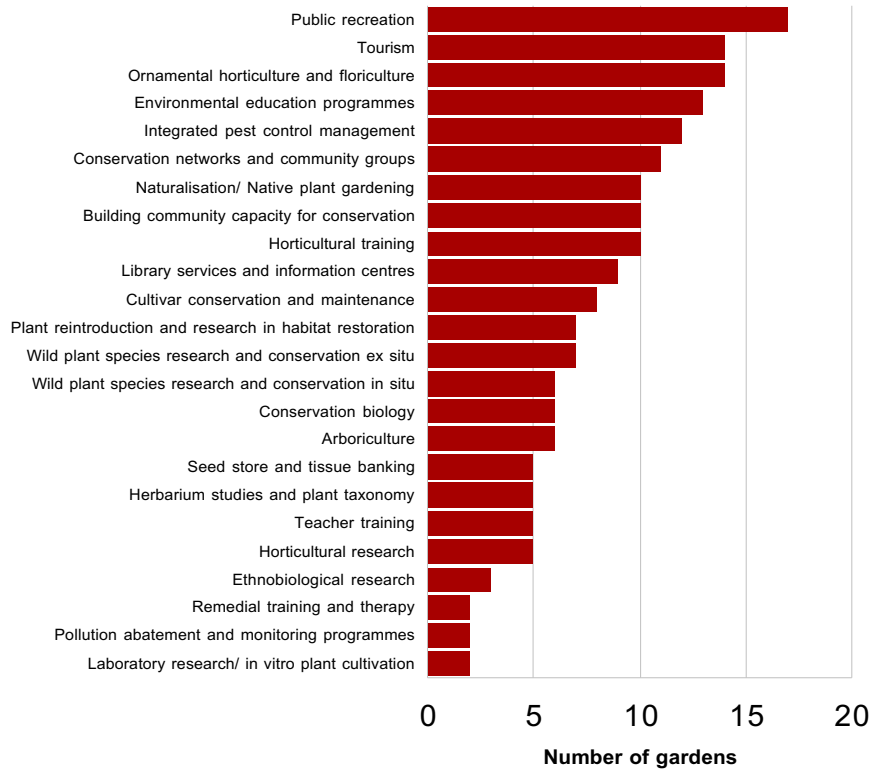
Institution	Main collections of research/ horticultural interest:	Theme Garden Areas / Natural Habitats
Morgan Arboretum	Aceraceae, Betulaceae, Celastraceae, Cupressaceae, Ericaceae, Fagaceae, Rhamnaceae, Rosaceae, Oleaceae, Salicaceae, Taxaceae, Tiliaceae, Pinaceae, Ulmaceae	<ul style="list-style-type: none"> • Blossom Corner, Maple Corner Rhododendron Corner • Fields: Fir and Hardwood, Larch, Lindens, Pine, Spruce • Canada Birch Trail, Premier’s Trail, North Grove Edge
Muttart Conservatory	Arecacea, Orchidaceae, Passifloraceae, Strelitziaceae	<ul style="list-style-type: none"> • Conservatories: Arid, Tropical, & Temperate • AAS (All American Selections) Garden
Niagara Parks Botanical Gardens	Aceraceae, Bignoniaceae, Cercidiphyllaceae, Cornaceae, Ebenaceae, Ericaceae Eucommiaceae, Fabaceae, Fagaceae, Ginkgoaceae, Hamamelidaceae, Juglandaceae, Magnoliaceae, Moraceae, Oleaceae, Platanaceae, Rosaceae, Rutaceae, Sapindaceae, Ulmaceae; Coniferous collections: Cupressaceae, Pinaceae, Taxodiaceae, Taxaceae (Additional collections: Acidophile, Alpine, Dwarf conifer, native and exotic woodland plants)	<ul style="list-style-type: none"> • Alpine, Arboretum, Butterfly, Dwarf conifers, Herb (culinary, economic, aromatic, medicinal), Rose, Shade • Butterfly conservatory: tropical/subtropical nectar/pollen producing plants
New Brunswick Botanical Garden	Conifer, Ericaceae	<ul style="list-style-type: none"> • Alpine, Annuals, Arboretum, Perriennial, Rhododendron, Rose, Shade, Vegetable • Riparian habitat
Royal Botanical Gardens	Cornaceae, Ericaceae, Iridaceae, Liliaceae, Magnoliaceae, Oleaceae (Syringa), Orchidaceae, Rosaceae, Paeoniaceae, Pinaceae, Ranunculaceae	<ul style="list-style-type: none"> • Arboretum, Discovery (Children’s), Heritage, Maze, Medicinal plants, Ontario Native Trees & Shrubs, Rock, Rhododendron, Rose, Wildlife Garden, Woodland Garden, Lillium (cultivar collection) • Carolinian Forest, meadow, Niagara Escarpment, stream/ riparian, wetland • Conservatories: Mediterranean, Arid plants
Reford Garden	Ericaceae, Gentianaceae, Liliaceae, Paeoniaceae, Primulaceae, Ranunculaceae, Rosacea	<ul style="list-style-type: none"> • Azelea, Blue Poppy, Crabapple, Gentian, House, Moss, Primula, Scree, Stream, Woodland • Habitats: wetland, woodland, meadow, river estuary, riparian, littoral and stream
Sherwood Fox Arboretum	Crataegus, Ericaceae, Fagaceae, Magnoliaceae, Rosaceae,	
Tofino Botanical Garden	Chilean plant collection, Ericaceae	<ul style="list-style-type: none"> • Childrens’, European Settlers, First Nations’, Heritage Plants, Hippy, Japanese, Kitchen, Medicinal Herbs • Coastal temperate rainforest, shoreline, pond

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Institution	Main collections of research/ horticultural interest:	Theme Garden Areas / Natural Habitats
Toronto Zoo	Asclepiadaceae, Asteraceae, Caprifoliaceae, Cornaceae, Poaceae, Rosaceae	<ul style="list-style-type: none"> • Biogeographical (Arid, tropical, savannah, temperate...), • Chinese & Rose gardens • Rouge Valley: stream, woodland, riparian habitats
UBC Botanical Garden	Aceraceae, Asteraceae, Berberidaceae, Caprifoliaceae, Cornaceae, Ericaceae, Fabaceae, Fagaceae, Lardizabalaceae, Lauraceae, Magnoliaceae, Myrtaceae, Papaveraceae, Primulaceae, Ranunculaceae, Rosaceae, Sapindaceae, Styracaceae (Additional collections: BC Native Flora, Alpine and Asian)	<ul style="list-style-type: none"> • Alpine, Asian, Food, Native Plants of British Columbia, Nitobe (Japanese), Physic • Forest, riparian & wetland habitats
VanDusen Botanical Garden	Aceraceae, Aquifoliaceae, Cornaceae, Ericaceae, Fabaceae, Fagaceae, Hamamelidaceae, Hydrangeaceae, Liliaceae, Magnoliaceae, Paeoniaceae, Picea, Rosaceae, Taxodiaceae Pteridophytes.	<ul style="list-style-type: none"> • Arboretum, Canadian Heritage, Eastern North American Flora, Fall Colour, Fern Dell, Heather, Japanese, Korean collection, Maples, Maze, Meconopsis Dell, Meadow Garden, Mediterranean, Perennial, Rock, Rhododendron Walk, Rose, Sino-Himalayan, Southern Hemisphere Flora, Swamp Cypress Pond, Winter Garden, Western North American Flora • Pond/ wetland habitats

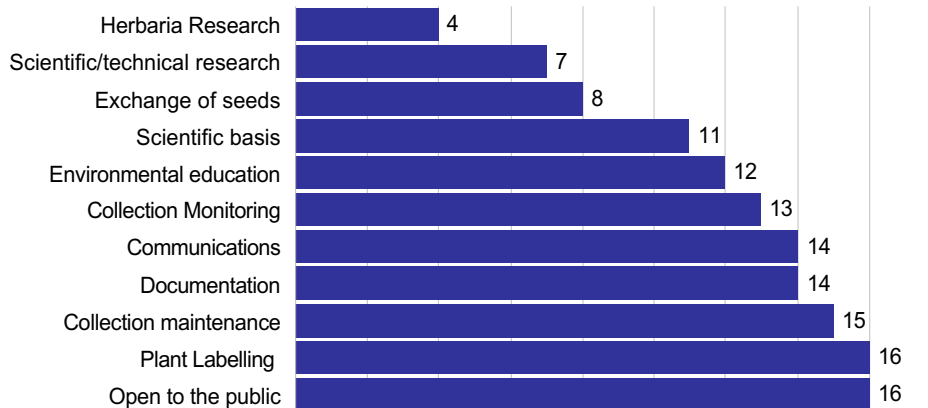
3. Major activities of institutions

Gardens also identified all of the major ongoing activities at their institutions.



4. Defining characteristics of institution

The following characteristics are often used to define a “botanical” garden; institutions listed which of these applied to their operations.



5. Visitor Statistics

Gardens and arboreta estimated the number of visitors that they receive each year, although they did note that visitation fluctuates with tourism, weather and health issues (SARS, West Nile...).

Approximate Yearly Vistation	# of Gardens/ facilities
Over 1 000 000	2
500 000 to 1 000 000	1
250 000 to 500 000	2
100 000 to 250 000	3
50 000 to 100 000	3
25 000 to 50 000	4
Under 25 000	2
Total combined yearly visitation: 4 445 000	

6. Plant Collections

Gardens provided the number of plants in their collection and also the representation of plant species listed as species at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The numbers listed are a sum of the totals given for each garden, and, as we did not collect nor compare species lists, there is undoubtedly overlap.

Horticultural species (total)	45 008
Canadian indigenous species (total)	1 740
COSEWIC species (total represented)	43
Digitised	10
Internet accessible	1
Data-base used: 4-BG Base; 3-Access; 1-Bi-con; 1- Foxpro; 1-custom	

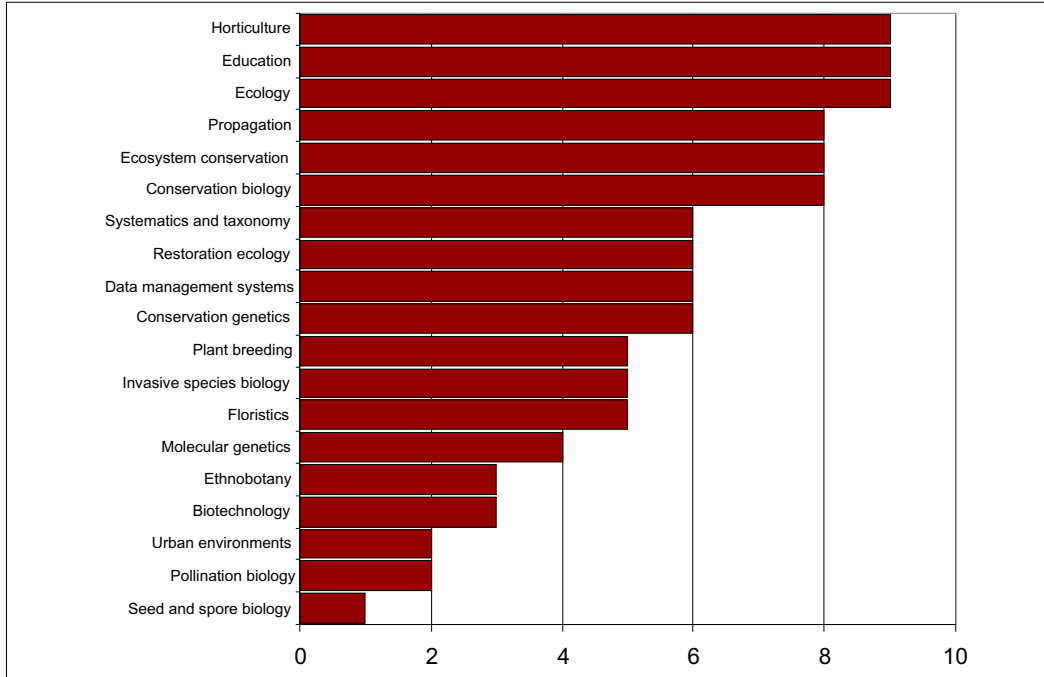
7. Herbaria

Institutions who own or co-operatively operate a herbarium supplied information about these facilities.

Herbarium is owned by institution	5
Associated with a herbarium owned by another organisation	4
Specimens	1 253 400
Digitised	7
Internet accessible	3
Data-base used: 1-BG Base; 2-Access; 1-Excel; 1-Interbase; 1- Filemakerpro; 1-custom	

8. Research Activities

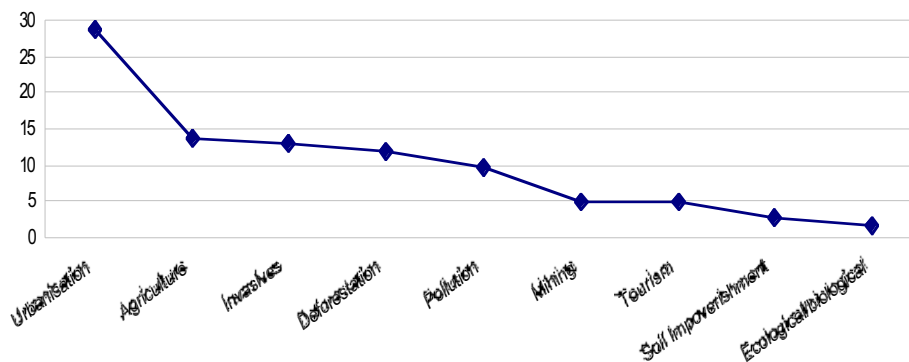
Gardens identified the types of research that are conducted at their facilities, either by staff or outside researchers/ associations.



9. Identified Local Plant Conservation Issues

Gardens ranked the three most serious threats to local plant conservation from highest to lowest (3, 2, and 1 points awarded respectively). They then provided some information about listed species and recovery planning efforts in their locality. The results and numbers provided here are sums of the answers that were given by the institutions and were not confirmed with provincial or national lists.

a. Perceived Habitat Conservation Threats:

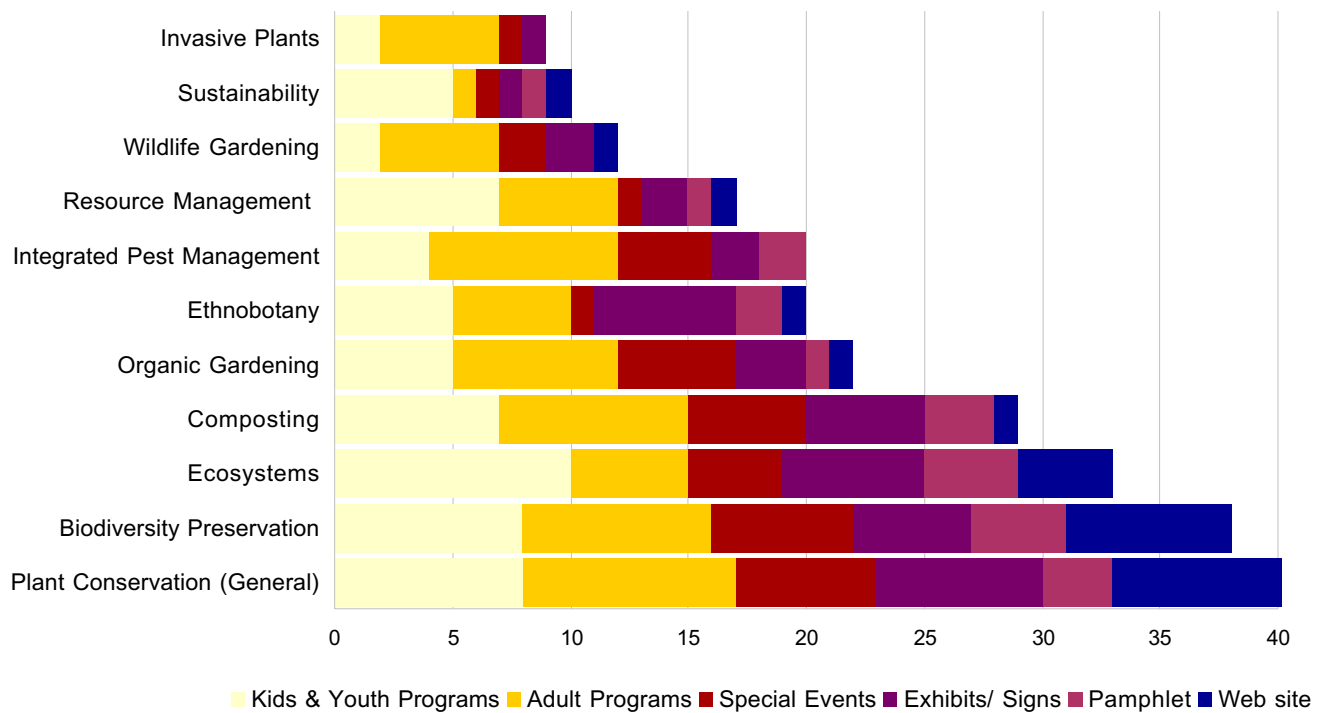


b. COSEWIC or provincially listed plant species:

Species at Risk local to botanical gardens/arboreta (provincial & national): 395
 # Existing Recovery Plans local to botanical gardens/arboreta: 17
 (Definitions of “local” varied between gardens, depending on geographical, social and political boundaries).

10. Conservation education in programmes and events

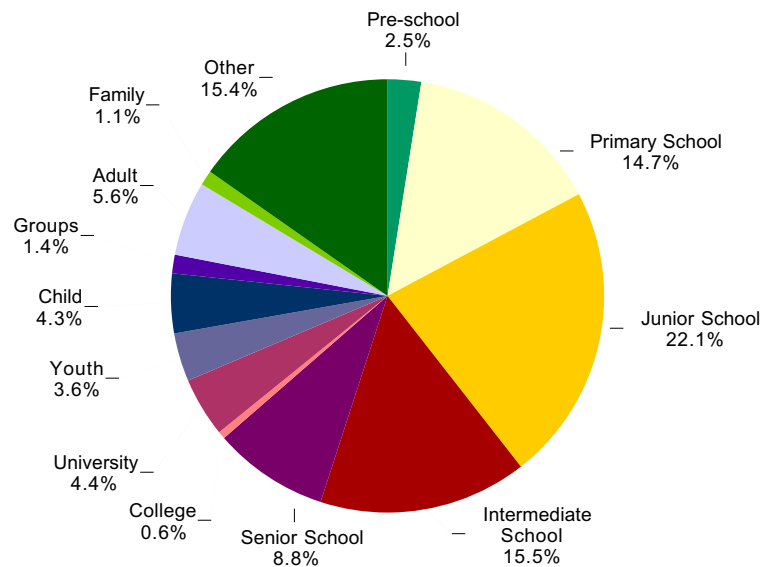
Each institution identified the means by which each of the following topics were addressed in their educational programming.



11. Educational programming participation

Each institution collects and records their educational statistics in different ways. The following table is an approximate breakdown of the distribution of participation in educational programming. It appears that roughly 2/3 of the participation is related to (school-based) education whereas 1/3 can be attributed to informal (self-motivated) learning.

Type of Education	Level/ Audience	Participants/ year
Formal	Pre-school	7 318
	Primary level (K-grade 3)	42638
	Junior level (grade 4-6)	64291
	Intermediate level (grade 7-10)	45071
	Senior/ CEGEP level (grade 11-12)	25 474
	Post-Secondary – College	1 758
	Post-Secondary – University	12 680
	Subtotal	199,230
Informal	Non-formal Youth (outside of school)	10 423
	Non-formal Children (outside of school)	12 600
	Organised groups (i.e. Scouts, Guides...)	4 045
	General Adult	16 119
	General Family	3 220
	Other (volunteers, homeschool, special events...)	44 686
		Subtotal
Total		290 323

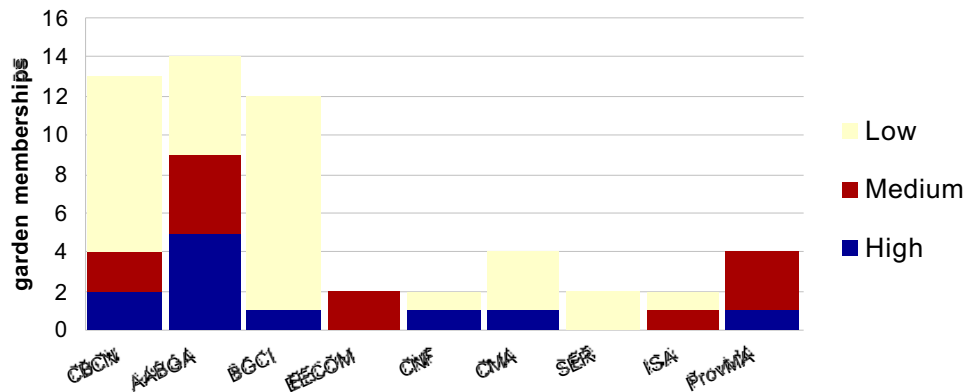


Approximate Education participants per year: 284 223

12. Networking & communication

Institutions listed the botanical, conservation and/or education organisations they are members of or have close co-operation with. They also assessed level of participation as low, medium or high. Associations and organisations mentioned were:

- Canadian Botanical Conservation Network (CBCN)
- American Association of Botanical Gardens and Arboreta (AABGA)
- Botanic Gardens Conservation International (BGCI)
- Canadian Network for Environmental Education & Communication (EECOM)
- Canadian Nature Federation (CNF)
- Canadian Museums Association (CMA)
- Society for Ecological Restoration (SER)
- International Society of Arboriculture (ISA)
- Provincial Museums Association (ProvMA)



Section B: Plant Conservation Projects/ Efforts

Gardens and arboretums are involved in a variety of conservation related projects:

Garden/ Arboretum	Conservation Project/ Effort
UBC Botanical Garden	<ul style="list-style-type: none"> - working on conservation research with Chinese botanical gardens & institutes; planning eventual restoration work with species being propagated at UBC - beginning plant inventory & status assessment work in alpine habitats of Queen Charlotte Islands - collaborate on UBC Herbarium “E Flora BC” project - participating in Gary Oak ecosystem restoration planning
Devonian Botanical Garden	<ul style="list-style-type: none"> - actively involved in rare plant inventories and completing COSEWIC status reports - member of the recovery team for Haller's apple moss (<i>Bartramia halleriana</i>) - working with local First Nation’s group on preserving traditional botanical knowledge - leading Alberta’s Plantwatch project and partnering on Canada-wide Plantwatch programme - host micro-fungal collection and herbarium
Assiniboine Park Conservatory	<ul style="list-style-type: none"> - working with Environment Canada’s CITES programme, providing haven for seized plants, primarily orchids and cacti
The Arboretum, University of Guelph	<ul style="list-style-type: none"> - Elm recovery project: breeding genetically resistant native elms by surveying and sampling of potentially resistant elms across Ontario and genetic testing for resistance - Gene Bank project: aiming to preserve genetic diversity of Ontario’s rare woody plants and producing seed for future restoration - co-leading Ontario Tree Atlas project: inventory and status assessment - Naturalisation projects: various sites - Participate in various ecological monitoring projects (i.e. Forest Bird Monitoring project; Breeding Bird Atlas...)
Royal Botanical Gardens	<ul style="list-style-type: none"> - Extensive wetland habitat restoration work (Project Paradise and Grindstone Estuary Rehabilitation project) - Established aquatic nursery to supply plants for restoration work in southern Ontario marshes - Actively involved in rare plant inventories and completing COSEWIC status reports for southern Ontario plant species - participate in recovery efforts for wood poppy (<i>Stylophorum diphyllum</i>), red mulberry (<i>Morus rubra</i>) and bashful bulrush (<i>Trichophorum planifolium</i>) - Remnant Tall Grass Prairie habitat restoration - Develop and participate in various ecological monitoring projects - Partnering in a botanical project to preserve traditional botanical knowledge of local First Nations people - Founding partner, on-going sponsor and host for the Canadian Botanical Conservation Network office - Partner on Canada-wide Plantwatch programme

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Toronto Zoo	<ul style="list-style-type: none"> - Major partner in Rouge Park biological surveys, inventories, monitoring and restoration efforts - Habitat restoration/conservation projects for Canadian amphibians and reptiles - On-site habitat restoration and creation (forest, wetland, butterfly meadows); - Participate in Oak savannah restoration project (Brighton) - Participate in invertebrate biodiversity monitoring and international seed exchange
Niagara Parks Botanical Gardens and School of Horticulture	<ul style="list-style-type: none"> - As part of the Niagara Parks Commission, participate in Niagara Parks management planning/implementation and Natural Heritage Inventory - Participate in recovery efforts for Deerberry (<i>Vaccinium stamineum</i>), Red Mulberry (<i>Morus rubra</i>), and other flora/fauna - Extensive riparian habitat management and several riparian buffer demonstration sites along 56 km of Niagara River/Gorge - Remnant Tall Grass Prairie, Black Oak Savannah and Chinquapin Oak Savannah habitat restoration - Planting of native trees/shrubs/wildflowers/grasses as part of several on-going ecological restoration projects - Established Steering Committee with several partner agencies determines direction of restoration efforts at Paradise Grove - Extensive invasive species removal at priority sites (i.e. designated ANSI areas) - Partnering with over fifteen agencies/organisations to mitigate and reverse human impacts on various ecosystems
Morgan Arboretum	<ul style="list-style-type: none"> - Habitat restoration project: Norway maple invasion of sugar maple forest - On-going plant inventory, monitoring and community assessment - Variety of additional research by professors and students at McGill including chipmunk ecology, dendrology and pollution assessment
Montreal Botanical Garden	<ul style="list-style-type: none"> - “Urgence Conservation” ex-situ conservation project: seed from provincially listed species at risk in Southern Quebec sent to Saskatoon and Kew; 66 species propagated and transplanted in public gardens for research and education - Ethnobotany research with Cree and Inuit communities in Northern Quebec to document and preserve traditional botanical knowledge - Phytoremediation research projects (domestic wastewater treatment, post treatment-plant sludge, and carbon absorption) - Plant inventories, ecological monitoring and on-going research projects (i.e. forest succession; competition, forest dynamics, micro-organism diversity and use for bio-control) - Invasive species research (ie. <i>Alnus rugosa</i>) - Major partner with IRVB (Institute de recherche en biologie végétale) and botanical research at University of Montreal - Environmental audit and management planning project - Partner on Canada-wide Plantwatch programme
Reford Garden	<ul style="list-style-type: none"> - Ecological survey, aquatic and terrestrial inventories and cartographic project of Métis River Park - ex-situ conservation study/ feasibility plan - Métis River estuary habitat restoration project

Memorial University of Newfoundland Botanical Garden	<ul style="list-style-type: none"> - Major partner in Limestone Barrens in-situ conservation programme - Ex-situ conservation programme for Long’s and Fernald’s braya (<i>Braya longii</i> et <i>Braya fernaldii</i>), and barrens willow (<i>Salix jejuna</i>) - Partner on systematic research with indigenous roses - Partner on Canada-wide Plantwatch programme
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Section C: Biodiversity and Conservation Education Programmes/ Efforts

Garden/ Arboretum	Education Project/ Programme
Tofino Botanical Garden	<ul style="list-style-type: none"> - in partnership with local non-profit education group, offer guided tours and children’s camps that highlight biodiversity and conservation issues - host part of a university environmental studies course - native plant labelling programme (including local aboriginal names) - self-guided tour includes interpretive material on native plant species, communities and ecosystems
Milner Botanical Gardens and Woodland	<ul style="list-style-type: none"> - Children’s gardening programme (promoting organic and sustainable gardening practices) - interpretive signage highlighting forest conservation, biodiversity and ecosystem concepts along trail through forest - ethnobotanical planting in food garden with interpretive signs and labels
VanDusen Botanical Garden	<ul style="list-style-type: none"> - Canadian Heritage garden interprets biodiversity, plant communities, conservation issues and ethnobotany through signage and displays - Additional garden displays and interpretive signs highlight important North American flora (i.e. locally endangered Garry Oak ecosystem) - Biodiversity, natural habitats, conservation and sustainable living is presented in school and family programming - a range of conservation-related topics are presented to volunteer guides through intensive professional development programme - Integrated pest management and native plant gardening are taught and promoted in Master Gardener and adult education courses - Host a seed collectors group that collect seeds and partner with Seeds of Diversity Canada to organise annual “Seedy Saturday” exchange & event
UBC Botanical Garden	<ul style="list-style-type: none"> - Conservation messages integrated into adult gardening courses - Science-oriented noon lecture series (presentations from faculty and employees on a range of subjects) - Friends of the Garden actively promote native plant gardening through gift shop (i.e. educational material and plants sold) - Native plants are presented in “Plants of British Columbia” garden - Provide technical and professional support and advice to NPBC (Native Plant Society of British Columbia) - While not specifically garden programmes, many university classes use gardens for teaching components of botany, biology, ecology, systematics, and environmental studies

Devonian Botanical Garden	<ul style="list-style-type: none">- School and children's camp programming includes biodiversity, natural habitats, conservation and ecosystem components- Adult education courses include, resource conservation, ethnobotany native plant and wildlife gardening- Through "Prairie and Northern Plant Diversity Centre" offers technical training in plant identification, ecological classification, monitoring and assessment- Native plants are interpreted in "Plants of Alberta" and "First Nations" gardens, along nature trails and in kiosk displays- Conservation messages communicated through Plantwatch programme and related workshops- Partner with Alberta Native Plant Council
Muttart Conservatory	<ul style="list-style-type: none">- Interpretive signs, guidebooks and displays highlighting temperate, arid and tropical biomes- Related school programmes highlighting ecology, biodiversity, ecosystems, botany and gardening
Assiniboine Park Conservatory	<ul style="list-style-type: none">- Adult education programmes include wildlife and native plant gardening, alternatives to invasive plants; environmental and conservation messages communicated in most programmes- On-site displays and interpretive material about wildlife gardening, native plant gardening, and alternatives to invasives- Special exhibit on CITES and stopping the trade of endangered species developed in partnership with Environment Canada- Host annual Seedy Saturday event & related workshops (composting, organic gardening and seed diversity)
The Arboretum, University of Guelph	<ul style="list-style-type: none">- Adult and family workshops covering a broad range of environmental/conservation topic (i.e. native plant gardening, pond and woodland gardening, forest conservation, school yard naturalisation, wildlife observation, art/nature appreciation...)- Offer an on-line university course on interpretation- Environmental education school programme (K to grade 6) and schoolyard naturalisation consultations have been put on hold due to lack of funding
Royal Botanical Gardens	<ul style="list-style-type: none">- School, children's camp and family programming includes ecology, biodiversity, habitat and wildlife conservation, ecosystem and organic gardening components- Adult education courses include: ecology, resource conservation, botany, ethnobotany, and native plant, organic and wildlife gardening- Interpretive signs and displays covering a range of topics, i.e. ecology, conservation, ecosystems, habitat restoration, geology, ethnobotany, native plant gardening, organic gardening and integrated pest management- Major partner in teacher training workshop/wetland habitat education programme ("Mini-Marsh")- Major partner in community environmental education project- Host yearly special events that present a range of conservation and environmental messages (i.e. "Green Gardening", Seedy Saturday, Festival of Birds, and Earth Day)- Extensive science and conservation component on web site

Toronto Zoo	<ul style="list-style-type: none">- Extensive school and children's camp programme covering a range of concepts such as ecology, biology, botany, conservation, habitats and communities, biodiversity, ecosystems and species at risk- Interpretive signs and displays highlight conservation, biodiversity, ecosystem and habitat restoration messages- Developed and co-ordinate Adopt-A-Pond programme, emphasising wetland habitat protection, conservation, and restoration- Offer intensive training/professional development programme to volunteers (responsible for a large portion of public education)- Promote wildlife monitoring programmes through education programme, demonstrations, workshops and special events (i.e. Toad Festival)
Niagara Parks Botanical Gardens and School of Horticulture	<ul style="list-style-type: none">- A broad range of conservation related topics are presented to the three year horticulture diploma students including: integrated pest management, resource conservation, invasive species management, wildlife and native plant gardening- Host several horticultural workshops, lectures, and conferences- Host annual "Project Tree Cycle" to re-cycle Christmas trees into garden mulch- Native plant labelling in the botanical gardens- School educational programmes on topics such as biodiversity, natural habitats, conservation, and ecosystems are offered at the Butterfly Conservatory- Special seasonal exhibits on CITES protected butterflies- Release of native species of butterflies into native butterfly gardens- Interpretive signage at various locations in Niagara Parks jurisdiction to explain species at risk, ecological protection, rehabilitation and restoration projects- Communication with public and adjacent landowners via Public Information Meetings to explain need and direction of on-site restoration efforts;- Host a variety of natural history events in Niagara Parks jurisdiction (i.e. spring wildflower walks, seasonal tree identification, "Walking Stick" weekends) and volunteer plant inventory days, garlic mustard removals, etc.- Developing special environmental events and exhibits
Morgan Arboretum	<ul style="list-style-type: none">- Some school, adult and family education programmes include ecology, conservation and biodiversity messages- Some interpretive signs and displays highlighting forest ecology and conservation- Ecological and conservation messages conveyed through special events, i.e. Taffy on Snow (maple sugaring), and Oktoberfest- Many university classes use gardens for teaching components of botany, biology, ecology, wildlife and resource conservation
Montreal Botanical Garden	<ul style="list-style-type: none">- School and children's day camp programming includes ecology, biodiversity, habitat and wildlife conservation, ecosystem, botany, ethnobotany, resource conservation and organic gardening components- Adult education courses (offered by the Friends of the Garden) include: ecology, resource conservation, botany, ethnobotany, and native plant, and organic gardening

(JBM cont.)	<ul style="list-style-type: none">- Interpretive signs and displays covering a range of topics, i.e. ecology, conservation, ecosystems, biodiversity, species-at-risk, botany, and ethnobotany- First Nations Garden and Tree house offer permanent interpretive exhibits and signs, guided hikes, and demonstrations highlighting ecology, biology, conservation, and ethnobotany- Partners on annual educators professional development workshop for the scientific institutions of Montreal- Host yearly special events (i.e. Seedy Sunday, Sugaring off Time (maple sugaring), Great Gardening Weekend and temporary exhibits (i.e. Forest Wardens, Noah’s Ark, Butterflies Go Free) that present a range of conservation and environmental messages- Extensive science and conservation component on web site
Reford Garden	<ul style="list-style-type: none">- School programming includes ecology, biodiversity, habitat and wildlife conservation, ecosystem, botany, ethnobotany, and resource conservation components- Developed and distribute “Lycée Vert”: curriculum based teacher’s activity guide for botanically-based conservation activities and “Littoral Zone Discovery Guide” that focus on conservation and ecology- Offer adult and family guided tours guest speaker series in summer highlighting ecology, ecosystems, ethnobotany, conservation and habitat restoration- Extensive marine and species-at-risk ecology component on web site
New Brunswick Botanical Garden	<ul style="list-style-type: none">- Offer adult workshops on resource conservation, composting, wildlife and organic gardening- Interpretive signs, displays and seasonal exhibits (i.e. Tropical Insects) that including organic gardening, ethnobotany, composting and conservation messages- University of Moncton students and Department of Forestry use collections and displays for teaching purposes
Memorial University of Newfoundland Botanical Garden	<ul style="list-style-type: none">- School, family, day camp and junior naturalists programming include components on ecology, ecosystems, biodiversity, resource conservation, habitats, ethnobotany, wildlife and organic gardening- On-site displays and interpretive material about botany, ecology, ecosystems, conservation, ethnobotany, wildlife gardening, native plant gardening, and invasives- Major partner in limestone barrens in-situ conservation project spear-heading an extensive community education and environmental stewardship effort

Section D: Biodiversity and Conservation Education Needs Assessment

1. Suggestions for additional information, material, resources and/or training

- Funding for exhibits on ecology & conservation (MUN – in field house)
- Labelling for indigenous plants
- Age appropriate conservation info
- List of conservation & education projects and contacts (similar to Nfld. Protected Areas Database)
- Public Info poster (similar to CWS Endangered Birds), linking to conservation and cultivating pride in unique Canadian habitats
- “conservation ecology” training package for teachers
- Couple of small travelling exhibits (i.e. Mini-Green Legacy) outlining Canadian (plants) Species-at-risk; habitats at risk, Canadian botanical gardens conservation efforts x2
- Edu-kits (like JBM)
- Botanical gardens conservation exhibit for Canada Blooms
- Employee exchange (x2)
- Regional botanical garden educators’ training workshops (finances, human resources, marketing, teacher training)
- Translation \$ for existing resources (i.e. Reford Garden’s teacher ed pack; JBMs edu-kits)
- Help with labelling (how, what, \$)
- Updated equipment (digital projector)
- Plant posters (i.e. Oxford Botanical Garden) (x2)
- Popular press articles on increasing general public connections with plants
- Resource guides
- Train-the-trainer programs for teachers
- Training on using endangered species as educational aids
- Presentations to staff & horticulture students about biodiversity conservation & bg role
- Staff education about insect control; West Nile virus, ticks...
- Interpretive signs
- School programme plans with ways to integrate bigger picture messages (i.e. Community Habitat protection...similar to CNF ladybug survey)
- Tips & tricks to integrate bigger picture messages to general bg visitors (broader perspective on plant conservation)
- Idea sharing on making plants exciting
- Booth at Ontario Garden show
- Small travelling exhibits
- Developing plant counts (like bird or butterfly)

2. Suggestions for web-based resources

- Samples of education programme outlines, lesson plans, programme activities (database?) x2
- Searchable database of education programs, outlines, lesson plans being offered elsewhere (x3)
- Plant links for people working on Species at Risk (i.e. Networking, funding, propagation, project profiles, general public info)
- Habitat based conservation info
- Interpretive training & on-line opportunities (x3)
- List of biodiversity/ conservation resources (reviewed & evaluated?) (x2)
- Links to IUCN info and sites
- Database searchable by major collections
- Botanical resource lists/ links
- Speakers lists for plant topics (x3)
- Curriculum content, lists
- Careers in botany, post-secondary courses over internet...
- Botany science fair project ideas (x2)
- Photo galleries (Species-at-risk, indigenous, invasives) (x2)
- Simulations of growth with & without invasives
- Discovery Cart/ Display ideas
- Discovery Garden
- Garden & Education Master plans
- Collections policy manual
- Herbarium educational material/ info
- Botanical art collections: importance, location...
- Opportunity to share info

3. Canadian Botanical Education Network: recommended forum to best suit needs

Total Votes	Medium	Biennial	Annual	Biannual	Quarterly	Monthly
5	Newsletter (paper)			1	3	1
12	Electronic newsletter			3	8	1
5	On-line forum				2	3
10	Meeting/Conference	4	6			
1	Conference call				1	
1	Other: list-serve					1

- Large conference with botanical gardens and academic associations, suggested joint initiative with Canadian Botanical Association & the Ecological Monitoring and Assessment Network
- Perhaps biennial national educators meeting, alternating with biennial regional educators meetings
- Participation always a question of time and financial resources

4. Suggestions for information/ education material:

(for in-garden use and/or distribution)

- Profile on Ecosystems/ habitats (need dynamic info)
- Regional CD-ROMs
- Yearly conservation theme – check with IUCN, botanical gardens poster or promotion?
- Invasive Species info (x2)
- Biodiversity Issues
- Species at Risk info
- Newsletter on biodiversity education programmes (models/ case studies)
- Slide packages, PowerPoint presentations (x2)
- 1-800 phone number for endangered species to generate endowment fund (link with WWF, BGCI ...)
- way for dealing with landowner questions
- Gardening with native species: keeping common species common
- Habitat restoration information
- Alternatives to pesticide
- Horticultural issues related to endangered Species Recovery
- Stewardship “tools” (e.g. homeowners guide to plant selection, non-natives that aren’t invasive, seed collection, transplanting/plant rescue) (x3)
- Native Plant Gardening: Regional suggested plant list
- Promo material: tattoos, fridge magnets, bumper stickers, trees for planting
- Gift shop items
- Kid-friendly video (x2)
- Ecology info: importance of plants in ecological contexts
- Herbarium info: value of & value of documented collection
- Botanical art: value & traditional role in historical conservation
- Role of botanical gardens
- Biodiversity posters using plant example (i.e. Maple)
- Wildlife Gardening
- Education for Sustainable living

5. Canadian “Botanical Garden Education Pack on Education and Sustainability”

- Fact sheets
- Photo gallery
- Global perspective: IUCN initiatives; Canadian; regional; provincial
- Biodiversity on a regional scale: ecosystem approach & interactions
- Available interpretive training courses (i.e. promote on-line interpretive course at University of Guelph)
- Zoo: CD-ROM end. Species tour; adopt a pond
- Library on web