NATURE-BASED SOLUTIONS BY DESIGN

LANDSCAPE ARCHITECTURE IN CANADA

Irving Eco-Centre, La Dune de Bouctouche NB. Basic Design
In 2015 the CSLA and its nine provincial, regional, and territorial component associations ratified the Canadian Landscape Charter (CLC). Through the CLC, the CSLA upholds the following core principles:

- Recognize landscapes as vital
- Consider all peoples
- Inspire stewardship
- Show leadership
- Expand knowledge

These core principles provide the foundation for the work of the profession. Currently the CSLA has Committees, Working Groups and Task Forces focussed on adaptation to climate change, urban canopy, advocacy for dark sky, cultural landscapes, indigenous reconciliation, diversity, equity, and inclusion, and on the influence of landscape on human health and well-being. These efforts demonstrate our profession’s commitment to advancing nature-based solutions as a practical, effective, and sustainable alternative to established urban and rural development.

Learn more about the Canadian Landscape Charter.
ENSURING A PROSPEROUS AND SUSTAINABLE FUTURE

For several decades, scientists throughout the globe have been sounding alarms over ongoing and devastating deterioration in ecosystems. Deterioration that has been exacerbated by continuing and escalating threats from global warming. Deforestation, unsustainable fisheries, destruction of waterways and pollution of the air have compromised the delivery of the critical ecosystem services upon which human populations depend. Added to these stresses, increasing levels of greenhouse gas emissions in our atmosphere have created a crisis in climate and contributed significantly to the frequency and intensity of severe weather.

Local, national, and global economies may be unable to keep pace with the growing demands placed upon existing and future fiscal and human resources. If we are to reduce the threats from a warming globe; maintain food and water security; and shelter populations from storms and disasters, environments and economies must march in step. As we emerge from the current pandemic and we strive to rebuild communities, economies and lives, there is little doubt that we need to find new pathways to ensure prosperity in environments and in societies.

Increasingly, decision-makers are relying on the principles embedded in the 17 United Nations Sustainable Development Goals (SDGs) to provide a blueprint for the conservation of nature, to ensure the reliability of ecosystem services, and to provide for the well-being of human communities.

In 2019, the World Council of the International Federation of Landscape Architects (IFLA) declared a Climate and Biodiversity Emergency. In response to this crisis, IFLA committed its members throughout the globe to the advancement of the United Nations SDGs.

In 2020, the United Nations began to focus on the linkages between the natural and built environments, placing an emphasis on nature-based solutions as one of the pathways to advancing progress on the SDGs. Nature-based solutions, not a new concept for landscape architects, are now seen as an integral tool in the battle to reduce atmospheric green-house gas emissions, and to ensure sustainability in environments and communities.
NATURE-BASED SOLUTIONS AND LANDSCAPE ARCHITECTURE

For almost 200 years, the profession of landscape architecture has sought to bridge the gap between the natural and the built environment. While the profession can trace its origins back to the early 18th century, since 1828, landscape architects have honed their knowledge and perfected their capacity to design with nature.

In Canada, landscape architects work to protect the wild and to promote planning and design that benefits and sustains both ecosystems and society. We have always recognized the economic, ecological and social services that natural assets contribute to our communities. We also understand that a personal experience with nature contributes significantly to our understanding and appreciation of the role nature plays in our world.

The CSLA understands that ecological health is essential to human well-being and continues to seek partnerships and pathways by which landscape architecture can contribute to sustainability. One of those pathways is through endorsement of the principles for application of Nature-based Solutions (NbS).

The CSLA believes that NbS offer innovative opportunities to meaningfully address multiple sustainability crises (e.g., climate change, food and water security, land degradation, loss of biodiversity, human well-being, and natural disasters). However, as interest grows in Canada for the application of NbS to planning, design and management, concerns are also arising over the myriad definitions for NbS that are emerging.

To ensure consistency of approach and to validate effectiveness in implementation, NbS undertaken in Canada will benefit from a combination of international guidance, national policies, and local knowledge and intuition. We must not only conserve our remaining wild spaces and systems, but we must also strive to ensure that nature has a productive and sustainable place within our communities, rural and urban.

“Nature-based Solutions are actions to protect, sustainably manage and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”

IUCN 2016 DOI: https://doi.org/10.2305/IUCN.CH.2016.13.en

Nature-based Solutions (NbS) provide society with powerful alternatives to challenges posed by climate change, biodiversity loss, food security and accessibility to clean water.
LANDSCAPE ARCHITECTS AND THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE (IUCN)

Landscape architects depend on science-based, indigenous, and local knowledge to inform their decisions and to inspire their efforts in planning and design. A broad knowledge is the fuel that drives creative and effective change.

Recognizing how fast environments are changing in today’s world, landscape architects often seek the newest science at a scale relevant to their work through constructive partnerships with scientists working in governments, academia, and international organizations. In doing so, we ensure that our profession operates on the best of current knowledge, and that we are capable and informed on changing priorities, policies, and best practices.

Notable among these partnerships is our evolving relationship with the International Union for the Conservation of Nature (IUCN).

In 2019, the International Federation of Landscape Architects (IFLA) was accepted as an international non-governmental organization (INGO) Member IUCN. IUCN Members provide a collective and global voice on issues important to current and future generations. Members of the IUCN develop needed partnerships with individuals and aligned organizations, strengthening their capacity and their credibility in matters related to the conservation and sustainable use of the Earth’s resources.

The IUCN is a membership Union composed of both more than 1,400 government and civil society organizations, including NGOs large and small, indigenous People’s organizations, scientific and academic institutions, and business associations.

The IUCN harnesses the experience, resources and reach of its Member organizations and the input of more than 17,000 experts who provide public, private, and non-governmental organizations with the knowledge, and tools to collectively enable human progress, economic development, and nature conservation. The diversity and vast expertise of this collegium ensures that the IUCN is the global authority on the status of the natural world and the measures needed to safeguard it.

The CSLA is one of 77 National Associations who form the World Council of the International Federation of Landscape Architects. Here in Canada, the CSLA is a NGO member of the Canadian Committee for the IUCN (CC-IUCN). The CC-IUCN works to bring together people, organizations, and ideas to advance a shared goal for the protection of biodiversity in Canada.

Working nationally and internationally, landscape architects continue to rely on guidance from the expert IUCN team on Nature-based Solutions. Learn more about the CC-IUCN and the IUCN.
IUCN GUIDANCE ON NATURE-BASED SOLUTIONS

In Canada, and throughout the world, there is a growing interest in NbS as an effective alternative to more traditional planning and design approaches. As a result, a range of perspectives, definitions, and criteria for NBS implementation is emerging.

To guide its members, and to ensure that NbS achieve their full potential to address society’s challenges, the CSLA relies on the IUCN definitions, criteria, and guidance for NbS.

In addition to the IUCN definition of NbS the IUCN Global Standard for NbS consists of 8 criteria (and 28 indicators) for designing, implementing, and assessing NbS. Professions, governments, businesses, investors, NGOs, and communities can find this information in several helpful IUCN publications.

CRITERIA FOR NATURE-BASED SOLUTIONS

1. Effectively addresses social challenges
2. Design is informed by scale
3. Results in a net gain to biodiversity and ecosystem integrity
4. Are economically viable
5. Are based on inclusive, transparent, and empowering governance processes
6. Equitably balances trade-offs between achievement of their primary goal(s) and the continued provision of multiple benefits
7. Are managed adaptively, based on evidence
8. Are sustainable and mainstreamed within an appropriate jurisdictional context

THE IUCN GLOBAL STANDARD AND AN EXPLANATION OF THE CRITERIA


Image Credit: O2 Planning+Design

Breathe: Edmonton’s Green Network Strategy; O2 Planning+ Design. 2018 National Award
**NOT ALL SOLUTIONS ARE NATURE-BASED**

Not all attempts to ‘green’ the built environment can be considered a Nature-based Solution. It is important to understand the differences. NbS use the power of functioning ecosystems as the infrastructure upon which to provide or enhance natural services that benefit society and the environment. Merely planting grass on a dyke or berm is not an NBS.

NbS have been successfully used to reduce greenhouse gas emissions, enhance resilience in ecosystems and communities and to improve stability in food and water supply systems. Working with nature can reduce a community’s costs for the provision of needed ecosystem services, slow environmental degradation and enhance well-being in human populations.

For example, NbS often address multiple issues at the same time. For example, urban canopy improvements reduce inner city heat, provide shelter to individuals and structures, and improve aesthetics and livability. Urban parks and greenspace protect existing ecosystems and create the protected space needed for new ecosystems to develop. Another example are stormwater management systems that use nature-based approaches reduce runoff to existing waterways, improve water quality, provide recreational space, and create additional ‘nature in the city’ amenities.

Most NbS project benefit from interdisciplinary approaches to planning and design, combining expertise from a range of disciplines and professions to create innovative solutions.

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**NATURE-BASED SOLUTIONS**

Nature-based solutions use the power of functioning ecosystems as the infrastructure upon which to provide or enhance natural services that benefit society and the environment.

**NATURE-DERIVED SOLUTIONS**

Nature-derived solutions include wind, tidal and solar energy projects, which are also needed to achieve a low-carbon and sustainable future but are not based directly on functioning ecosystems.

**NATURE-INSPIRED SOLUTIONS**

Nature-inspired solutions use innovative design and/or employ materials, structures and systems modeled on or inspired by nature and by biological processes. Such as the sticky gloves based on the gecko’s feet.

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ECOLOGICAL AND HUMAN WELL-BEING

Landscape architects have always sought ways to effectively address social challenges such as social justice, equity, and inclusion through their efforts in planning and design. Early inclusion of traditional knowledge continues to make significant contributions to our understanding of human interaction with the landscape over time. Local knowledge and space-based design approaches ensure that all co-benefits from each project are insightfully captured and enhanced where possible.

Definition of and enhancement of the social co-benefits of our work has long been an integral component of early planning and later detailed design and execution. Throughout our history our profession has sought innovative ways to bring nature to the city, to enhance human-well-being through contact with nature, and to ensure that the greatest benefits accrue from the lowest expenditures of resources.

Humans are an integral component of every ecosystem in which they live, and while we continue to rely on the services nature provides, too often we are not cognizant of the responsibility we bear for environmental sustainability. Landscape architects seek to change that.

In its 2020 Declaration, the IFLA World Council endorsed the profession’s role in increasing awareness of the relationship between natural and cultural aspects of planning and design to enhance and sustain healthy ecosystems and the well-being of human communities, recognizing their interdependence.

The IFLA Declaration challenges all landscape architects to:

- recognise that health and wellbeing are intrinsically linked to ecological health.
- recognise the link between the natural and cultural aspects of design for healthy ecologies and communities, their inter-dependence and enhancement of each other.
- partner with academic, corporate and NGO colleagues to further understanding of these links and propose immediate actions to embed this knowledge within educational programs and as industry standards.
- promote the use of nature-based solutions by interdisciplinary teams working to solve the complex challenges posed especially by climate change and COVID-19.
Nature-based approaches to planning, design and management are not new to Canadian landscape architects. In addition to our work on national and regional parks, as early as 1900, Canadian landscape architects like Frederick Gage Todd and Charles Ernest Wolverton were working with pioneers in the field such as Frederick Law Olmsted to advance town planning and to secure, protect and plan urban natural environments such as Mount Royal Park in Montréal, Assiniboine Park in Winnipeg, Wascana and Victoria Parks in Regina and Bowering Park in St. John’s. These important urban ecosystems are imbedded in Canadian culture and rank among the many greenspaces created or enhanced by landscape architects that protect the wild in communities of every size throughout the nation.

For generations, Canada’s landscape architects have worked tirelessly to advance the conservation of ecosystems and to encourage creative design and innovative technologies that ensure the sustainability of environments and of ecosystem services. The work of the profession can be seen in innovative approaches to storm water management, rehabilitation of aquatic and marine shorelines, restoration of impacted industrial landscapes, and in the creation of communities that demonstrate a true integration of nature and the city.

**POTENTIAL EXAMPLES OF LOCAL NbS**

None of these examples are new, but all can be reimagined to ensure they meet the NbS criteria:

- planting trees and shrubs along riverbanks and shorelines to restore bankside vegetation, stabilize the watercourse, and reduce erosion and sedimentation
- daylighting streams to restore the natural watercourse, improve stormwater management and reduce flooding
- interspersing crops with tree and shrub hedges to provide shade, retain water and enhance habitat for wild species
- planting tree and shrub windbreaks along roads and fields to slow the wind, retain the soil and provide habitat
- restoration of prairie and grassland habitats
- reforestation and afforestation of steep slopes to stabilize the earth and prevent landslides
- protecting, enhancing, and conserving wetlands, salt marshes and marine kelp and seaweed beds to stabilize habitat, improve water quality, and promote sustainable fisheries
- increasing shoreline resilience by respecting natural processes, enhancing terrestrial and marine habitats, and providing recreational opportunities
- protecting urban and rural water supply areas to sustain clean potable water and natural heritage ecosystems
- enhancing and sustaining urban canopy to provide shelter, reduce urban heat, improve human well being and restore urban habitats
- restoring degraded lands and waters to enhance and sustain terrestrial and aquatic habitats and potentially to improve neighbourhood aesthetics, access to nature, and property values.
As Canada faces the impacts of a changing climate, landscape architects are at work reducing emissions, building resilience in ecosystems and society, transforming our communities, and advancing sustainability.

We have been working with government and academic scientists to advance better understanding of the effects that continuing climate change will have on temperatures, growing seasons, precipitation, sea level rise, severe weather, flooding, and drought. We have sought new paths for timely communication of emerging knowledge to decision-makers.

Our profession is skilled not only in innovative planning and design, but we are also knowledgeable on social justice, cultural landscapes, and indigenous reconciliation. Above all, we are great communicators, trained to listen, to understand and to employ local knowledge and to address local issues to ensure community acceptance of new ideas.

We understand just how complicated planning and design has become in societies and environments that face uncertain and changing conditions.

Landscape architects believe interdisciplinary teams are necessary if we are to develop creative alternatives to traditional practice, and if we are to ensure that we achieve the ecosystem benefits and co-benefits that are the foundation of NbS.

The CSLA is honoured to have been recognized as a Champion for climate change planning and design with the International Federation of Landscape Architects. We support collaboration and sharing of knowledge, resources, and experiences with our colleagues throughout Canada and around the globe.

The Canadian Government on Nature-based Solutions to Climate Change

“Investing in nature, and its protection, is among the most affordable climate action governments can take. Forests, wetlands, oceans, and more, absorb and store enormous amounts of carbon, which can mitigate the impacts of climate change, and keep our air and water clean. In fact, nature-based solutions to climate change can provide almost 40 per cent of the emission reductions needed by 2030 – 30 per cent more than previously estimated. Pristine green and blue spaces provide recreational opportunities that improve quality of life and are part of Canadian culture and identity.”

GOC .2020. Fall Economic Statement. Section 3.3.2.3
ECOSYSTEM SUSTAINABILITY

In addition to creating and rehabilitating damaged ecosystems, landscape architects have been at work conserving Canada’s wild. From the first National Parks to small spaces within cities, landscape architects work to protect and enhance ecosystems, and to ensure their sustainability. Gone are the days of concrete riverbanks and filled wetlands. NbS value every ecosystem, no matter its size.

Lethbridge River Valley Parks Master Plan; O2 Planning + Design; 2018 National Award
NATURE IN THE CITY

In 2021, the CSLA became a Partner NGO of the #NatureForAll global movement to inspire a love of nature.

A personal experience with nature is a significant contributor to how a person values natural assets. The inclusion of nature in our communities provides everyone with the opportunity to be in nature.

Natural environments planned, designed, and executed to provide both amenity and ecosystem services are also important economic assets – saving communities money every day. Stabilization of river shores, protection of wetlands and enhancement of urban forests create opportunities for both wildlife and humans, reduce stormwater impacts, lower urban heat and energy demands, and improve water quality.

Restored, enhanced, protected ecosystems provide access to nature, even for city dwellers. Access that is important to individual well-being, especially during a pandemic.

NatureForAll advocates that:

- a personal experience with nature leads to...
- a love of nature which improves...
- the value placed on natural assets and contributes to ....
- increased support for nature, conservation,
SHORELINES AND RIVERBANKS

Few Canadians realize that the restored and functioning shoreline they now enjoy, or the flood control measures that keep them safe from sea level rise, storm surges and overland flooding may have been the result of landscape architects working collaboratively on interdisciplinary teams with engineers, oceanographers, soils experts, ecologists, sociologists, and climate specialists. Whether on Vancouver shorelines, Toronto river mouths, or the sand dunes of the East coast, landscape architects are participating on or leading innovative teams seeking NbS to existing and emerging challenges.
STORMWATER MANAGEMENT

As the climate changes and weather events intensify, there are increasing instances of extreme storm events, sometimes with precipitation events that exceed expected levels for 500+-year storms. Communities are finding that existing stormwater management infrastructure is neither adequate to service these cloud bursts nor are they sufficient to withstand hours or days of heavy precipitation.

Landscape architects have been designing low impact development sites for decades, utilizing a range of new non-impervious pavements, as well as working with existing natural waterways.

Whether the efforts focus on bioswales in residential areas, or in redesign for road drainage standards, there are many opportunities to capture, to slow and to re-inject precipitation back into the water table.

In several of Canada’s largest communities, there has been a renewed focus on the services provided by natural drainage systems, leading to renewed efforts to ensure they continue as prosperous, functional ecosystems. Creative inner-city design also offers opportunities to daylight buried streams, to stabilize shorelines and riverbanks through naturalization with native species of trees and shrubs, and even to utilize stormwater as an amenities in the urban core.
AFFORESTATION

Canada has committed to the planting of 2 billion trees over the next ten years as one of the pathways to reducing carbon pollution and achieving net-zero greenhouse gas emissions by 2050.

Canada has been managing sustainable forestry operations for years, where reforestation is an integral component of forestry practice. Afforestation at its simplest is the planting of trees where there was no previous tree cover. Canadian landscape architects have been working with municipalities for decades, advocating for the planting of new trees along roadways, in green space and in parks and protected areas.

Our commitment to the planting of new trees is matched by our enduring efforts to manage the local and urban forests we already have. Increasingly, communities are seeking ways to enhance their urban canopy, to create forests rather than tree clusters, and to ensure the sustainability of their investment in green space.

Partnering with the Canadian landscape industry, the CSLA has produced the Canadian Landscape Standard, a technical guide to ensure that the trees we chose and the trees we plant are the right species for the space and time and are planted to ensure their prosperous growth.

“There is no path to net-zero emissions that does not involve our forests. Planting trees is a natural climate solution that reduces emissions while providing other benefits such as improved air and water quality, particularly in urban settings; decreased risk of wildland fire to rural communities and support for biodiversity. It also provides spaces for recreational opportunities that improve quality of life and form part of our Canadian identity.”

Seamus O’Regan, Canada’s Minister of Natural Resources, Dec 14, 2020
The CSLA Website provides an array of information and resources offered freely to the public. While these materials were prepared for landscape architects and their colleagues, there is much that could be of use to decision-makers and others.

**ENLIGHTENED PLANNING AND DESIGN**

When landscape architects are employed appropriately at the beginning of the planning process, development can achieve a far better return on the investment.

But more significantly, properly supported by enlightened clients and systems, landscape architects can ensure the development of more sustainable and resilient towns and cities, urban realm, transport systems, parks, squares, agriculture, forestry, energy, and water system solutions as well as creating a greater sense of place and community.

All of this is vital for health, wealth, and well-being of communities in every country.

*IFLA President, Kathryn Moore IFLA Bulletin (June 2018)*
RESOURCES

FROM THE CSLA WEBSITE: www.csla-aapc.ca

CLIMATE CHANGE:  https://www.csla-aapc.ca/mission-areas/climate-change

ADAPTATION PRIMERS:  https://www.csla-aapc.ca/mission-areas/primers


HUMAN HEALTH AND WELLBEING:  https://www.csla-aapc.ca/mission-areas/human-health-well-being

CULTURAL LANDSCAPES:  https://www.csla-aapc.ca/mission-areas/cultural-landscapes

DIVERSITY AND EQUITY:  https://www.csla-aapc.ca/mission-areas/diversity-and-equity

RECONCILIATION:  https://www.csla-aapc.ca/mission-areas/reconciliation

URBAN CANOPY:  https://www.csla-aapc.ca/mission-areas/urban-canopy

CANADIAN LANDSCAPE STANDARD:  https://www.csla-aapc.ca/standard

LANDSCAPES / PAYSAGES:  https://www.csla-aapc.ca/landscapes-paysages/back-issues

CSLA AWARDS OF EXCELLENCE AWARDS ATLAS:  https://www.csla-aapc.ca/awards/awards-atlas

FROM THE IFLA WEBSITE: www.iflaworld.com

IFLA WORLD:  https://www.iflaworld.com/


IFLA DECLARATION OF CLIMATE AND BIODIVERSITY EMERGENCY:  https://www.iflaworld.com/newsblog/ifla-declares-a-climate-and-biodiversity-emergency

IFLA DECLARATION ON ECOLOGICAL AND COMMUNITY HEALTH:  https://www.iflaworld.com/ifla-declaration-on-

FROM THE IUCN WEBSITE: www.iucn.org

IUCN NATURE-BASED SOLUTIONS:  http://www.iucn.org/theme/nature-based-solutions

IUCN 2016: COMMUNITIES, CONSERVATION AND LIVLIHOODS: DOI:  https://doi.org/10.2305/IUCN.CH.2021.01.en

IUCN 2020: GLOBAL STANDARD FOR NBS: DOI:  https://doi.org/10.2305/IUCN.CH.2020.08.en


NATURE FOR ALL:  https://www.natureforall.global

NATURE FOR ALL PUBLICATIONS:  https://natureforall.global/publications

CONNECTING WITH NATURE:  https://natureforall.global/why
Many of the projects described in this document have won a CSLA Award of Excellence. Learn more about our award winners online and experience through pictures the ever-expanding range of landscape architecture in Canada today.

The Awards of Excellence honour distinctive design, ground-breaking research, sustainable landscape management and much more. Landscape architects revitalize derelict inner-city shorelines and fashion pedestrian-friendly streetscapes. They build avant-garde residential gardens and turn brownfields into sustainable parks. They shape our urban landscapes, spearheading city-wide planning and design. Each year, jurors select exceptional projects across many areas of expertise.

www.csla-aapc.ca/awards/awards-atlas