

Natural and Nature Based Features Workshop

CZC 2016 Conference, Toronto

Summary of the Workshop Findings

March 20, 2017

Prepared by:



Zuzek inc.
— ONE WORLD —

Contact the Author:
Peter J. Zuzek
pzuzek@zuzekinc.com
905-719-8980



Sample of Natural and Nature-Based Features

(left to right, Dunes and Beaches, Vegetated Features, Coral and Oyster Reefs, Barrier Islands, Forest/Shrub Communities)



Courtesy of USACE 2015



EXECUTIVE SUMMARY

A workshop was convened on June 15, 2016 during the Coastal Zone Canada conference in Toronto to explore the feasibility of a new Community of Practice (COP) on Natural and Nature-Based Features (NNBF). The meeting included background presentations on the rationale to promote more nature-based solutions for our coastline, design considerations, local examples from the Toronto Waterfront, ongoing activities in New York State, and the Green Shores™ program in British Columbia, which promotes sustainable coastal development.

Breakout sessions focused on barriers to implementation to date, selection of alternatives based on site conditions, and the need for more case studies. Research needs were also summarized, along with opportunities for expanded protected areas (i.e., more natural undeveloped areas), and knowledge dissemination. Opportunities for better inclusion in our regulatory frameworks were also discussed, along with potential improvements to legislation.

There was overwhelming support for the creation of a COP on NNBF. In fact, several of the participants raised the point that with the dialog at the meeting we had already started the COP. And the Coastal Zone Canada Association has been running an unofficial COP on coastal management for more than 20 years. Key messages and recommendations include:

- Opportunities for bi-national cooperation on the COP should be explored
- Ultimately, geography is not as important as creating a rich learning opportunity and effective knowledge sharing to promote nature-based solutions
- The objectives and focus of the COP needs to be finalized (i.e., nature-based shorelines versus a broader mandate of coastal management with sub-COPs)
- Initial seed funding is required to kick-start the COP, along with a core leadership group
- Future sustainable funding is critical to the long-term survival of the COP. Target a broad range of potential funding partners to balance highs and lows of funding cycles
- Government support for the COP is welcomed but it should ultimately be hosted and managed by a third party, ENGO, or university so it represents an independent voice
- Non-financial membership should be considered to screen out non-productive dialog
- The governance structure is important to ensure the accuracy and quality of the guidance developed and ultimately disseminated to members

The meeting concluded with a field trip led by Gord MacPherson from the Toronto and Region Conservation Authority to observe restoration and erosion mitigation projects that included innovative nature-based features, including large-scale wetland creation, sand and cobble beaches, shoals and islands, and dune grass ecosystem restoration. The integration of new public access nodes to the waterfront was also highlighted as a key component to the success of the restoration projects. To quote our field trip leader: “Habitat restoration is as simple as the ABC’s; you just have to get the abiotic, biotic and community integration right!”





TABLE OF CONTENTS

1	INTRODUCTION	1
2	PART 1 - PRESENTATIONS	2
2.1	Rationale for Natural and Nature-Based Features; Dr. Julie Dean Rosati	2
2.2	Nature Based Shoreline Decision Making: Overview of Geology, Driving Forces, and Coastal Processes; Pete Zuzek	2
2.3	Shoreline Regeneration Along the Toronto Waterfront, Gord MacPherson	3
2.4	New York Sea Grant Shoreline Management Updates, Heather Weitzner	3
2.5	The Green Shores™ Programs in British Columbia, Susan Davidson	4
3	PART 2 – BREAKOUT SESSIONS	6
3.1	Where and When NNBF will Work, Scudder Mackey	6
3.2	Existing Examples and Potential Future Case Studies, Gene Clark	6
3.3	Research Needs for NNBF, Bryan Hinterberger	7
3.4	The Role of Protected Areas and Opportunities for Expansion, Scott Parker	8
3.5	Knowledge Dissemination to Land Owners, Designers, Contractors and Regulatory Staff, Kate Hayes	9
3.6	Integration of NNBF into our Regulatory Frameworks, Sandra George	9
4	PART 3 – NEEDS AND OPPORTUNITIES FOR A COMMUNITY OF PRACTICE	11
4.1	Summary of Discussion	11
5	FIELD TRIP	15
	REFERENCES	16

APPENDIX A – WORKSHOP PRESENTATIONS

APPENDIX B – PARTIAL LIST OF WORKSHOP ATTENDEES



1 INTRODUCTION

The Natural and Nature Based Features (NNBF) Workshop was organized and held during the Coastal Zone Canada 2016 conference, Chestnut Convention Centre, Toronto, Ontario, Canada. The workshop was executed on Wednesday June 15, 2016 and followed by a one day field trip along the Toronto and Scarborough waterfronts.

NNBF are of heightened interest to coastal practitioners, engineers and scientists for their aesthetic capabilities, storm damage reduction, and habitat creation potential. They can naturally increase the resilience of our coastal zones and represent a valuable adaptation approach to the threats associated with climate change. However, the engineering and economic benefits of NNBF to increase coastal resilience have only recently been studied (USACE, 2015), and guidance for design, ecological function, performance capabilities, maintenance requirements, costs, and adaptive potential is lacking.

The workshop was organized to explore recent successes and lessons learned concerning design and performance of naturally-occurring and constructed NNBF features within the Great Lakes, ocean coastlines, and estuarine zones. The dialog built on a Nature-Based Shorelines workshop held in Rochester, New York in November 2015, which was hosted by the NY Department of Environmental Conservation, and the NY and Wisconsin Sea Grants. A summary of the workshop can be accessed on the NY Sea Grant Website at:

www.nyseagrant.org/naturebasedshorelines

Background information on NNBF was provided during a series of presentations. Breakout sessions explored barriers to implementation, existing examples, research needs, the role of protected areas, knowledge dissemination, and regulatory issues. The potential for joint Canadian and USA demonstration sites were also explored. The interest and potential opportunities for the development of a bi-national community of practice to advance the implementation of NNBF was also discussed.

On Thursday June 16, 2016 many of the workshop participants joined Gord MacPherson, Associate Director of Restoration for the Toronto Region Conservation Authority, on a field trip to observe local examples of NNBF along the coast of Lake Ontario. A wide variety of projects were visited, including the proposed Don River Mouth re-alignment, habitat creation projects in Tommy Thompson Park, large-scale erosion mitigation along the Scarborough Bluffs, and coastal dune restoration in the Frenchman's Bay area.



2 PART 1 - PRESENTATIONS

The opening session of the workshop included introductory comments by Randy French, French Planning Services Inc., and five background presentations.

2.1 Rationale for Natural and Nature-Based Features; Dr. Julie Dean Rosati

Dr. Julie Dean Rosati from the Coastal & Hydraulics Laboratory, Engineering Research Development Center of the US Army Corps of Engineers, provided an introductory presentation on why NNBF are important and of heightened interest within the US Federal Government. A copy of the presentation is provided in Appendix A and summarized below:

- Based on a United Nations (2003) assessment, half the world's wetlands have been lost since 1900
- Also from the United Nations, over 25% of the earth's lands are considered highly degraded (deforestation, desertification, wetland destruction, erosion and contamination)
- NNBF can address habitat degradation and restore wetlands
- NNBF provide multiple benefits, including ecosystem services (produce food, clean water), hazard mitigation (reduce damages from storm surges, flooding and erosion), enhance aesthetics, create tourism opportunities, and increase coastal resiliency
- At the time of the meeting, the White House had recently directed all Federal agencies to incorporate the value of green infrastructure and ecosystem services in Federal planning and decision making
- Pilot studies are needed as proof of concept, followed by monitoring and adaptive learning

2.2 Nature Based Shoreline Decision Making: Overview of Geology, Driving Forces, and Coastal Processes; Pete Zuzek

Pete Zuzek from Zuzek Inc. provided an introductory presentation on key considerations when evaluating NNBF alternatives, including geology, driving forces, and littoral cell boundaries. A copy of the presentation is provided in Appendix A. The key messages are listed:

- The framework geology of a site will have a significant influence on the range of options for NNBFs. Need to understand local geology and influence on coastal evolution
- Development of our coastline, especially along eroding shorelines, eventually leads to shoreline armoring. The ecosystem services from hardened shorelines are limited, as are the potential for restoration projects or the integration of NNBF
- It is critical to quantify driving forces at a site, such as wave heights, historical lake level ranges and anticipated future conditions, storm surge magnitude, and ice cover (including anticipated future conditions)
- Littoral cells are artificial boundaries that define the spatial extent of sediment movement along Great Lakes coastlines. All littoral cells include an eroding updrift portion and a depositional downdrift region. Understanding where a potential project is located relative



to its littoral cell is critical to understand long-term shoreline change trends and design considerations

- When developing management plans to address watershed stressors and the cumulative effects along the coast, the spatial boundary of the management program should include both watershed and coastal environment in the lakes. When combining watersheds and littoral cell boundaries, a new term was introduced (littoralshed)

2.3 Shoreline Regeneration Along the Toronto Waterfront, Gord MacPherson

Gord MacPherson, Toronto and Region Conservation Authority, provided a historical perspective on the Toronto waterfront, from 1830 to present. He highlight numerous recent large-scale restoration projects using nature based techniques. The key highlights from Gord's presentation include:

- In 1830 the Toronto Islands was a natural sand spit at the mouth of the Don River and Ashbridges Bay was a large coastal wetland complex
- By the early 1900s significant modifications to the shoreline had occurred, including two navigation channels into Toronto Harbour and the series of small islands were stabilized with vertical structures. Plus, over a million cubic yards of cobbles and boulders were removed from the beaches by a process known as stone hooking
- Fast forward to the early 2000 and Toronto Harbour was dramatically altered by lake fill and vertical sheetpile edge treatment for shipping and commercial navigation. Plus, the Leslie Street Spit was created with fill and concrete rubble, cutting the Toronto Islands off from their natural sediment supply to the east (i.e., Scarborough Bluffs)
- A large naturalization project for the mouth of the Don River is in the planning stages, to replace the engineered rivermouth with a natural outlet and habitat creation. The funding for the project will come from the re-development of the surrounding port lands
- Tommy Thompson Park has featured numerous large scale wetland restoration projects and significant effort to naturalize the waters edge, leading to new habitat for fish, reptiles, amphibians, and birds
- The restoration work on the Toronto waterfront is supported by Aquatic Habitat Toronto (AHT), which is a partnership between Toronto and Region Conservation, the federal and provincial governments, and the City of Toronto. Collectively, AHT promote and implement the Toronto Waterfront Aquatic Habitat Restoration Strategy and provide coordinated agency comments on development applications.

2.4 New York Sea Grant Shoreline Management Updates, Heather Weitzner

Heather Weitzner, formally of the New York Sea Grant, provided background on the relevant aspects of their shoreline management program. Highlights from the presentation include:



- The New York Sea Grant (NYSG) focuses on research, education and extension services to the coastal communities of NY State. The NYSG is presently focusing on healthy coastal ecosystems, sustainable fisheries and seafood business, environmental literacy, workforce development, and increasing resilience in NY coastal communities
- The NYSG was a co-organizer of a Nature Based Shorelines Workshop in November 2015, focused on existing methods, their applicability to the New York Great Lakes shorelines, and data needs (research, outreach, demonstration projects). The workshop participants focused on identification of potential demonstration sites, information needs, and tools required to implement a project
- From a regulatory perspective, some of the challenges faced when evaluating nature based alternatives include lack of education, proof of effectiveness of alternatives, and culture change requirements to embrace these alternatives over traditional engineering structures
- The workshop attendees identified the following next steps as critical to advancing living shoreline implementation: training and education, continuous dialog among participants (government, land owners, and contractors), demonstration projects to highlight successes and failures, additional scientific information (e.g., understanding of coastal littoral cell budgets)
- Shoreline Management Tours were organized following the workshop to look for potential demonstration sites based on local issues and land ownership, plus observe existing living shorelines. Similar tours are routinely organized by the Pennsylvania Sea Grant, inviting engineers and landscape architects, private land owners, contactors, and realtors.

2.5 The Green Shores™ Programs in British Columbia, Susan Davidson

Susan Davison from Sea Science Inc. provided an overview of the Green Shores™ accreditation program in British Columbia. Ms. Davison is not one of the developers or implementers of Green Shores™ but she does have familiarity with the program. The highlights of the presentation include:

- Green Shores™ is a program designed to encourage sustainable use of shoreline ecosystems through planning and design that recognizes the ecological features and functions of shoreline systems. There is a program for residential homes and larger developments
- Principles include preserving or restoring physical processes, maintaining or enhancing habitat function, prevention or reduction of pollutants entering the aquatic environment, avoidance or reduction of cumulative impacts
- The program is focused on education and outreach, providing workshops and training seminars for land owners
- There is also a rating system that evaluates whether a project meets all the prerequisite criteria (e.g., conservation of sensitive habitat and coastal sediment processes) and evaluates if additional credits are warranted (e.g., shore friendly public access, integrated stormwater design, rehabilitation of coastal habitats, and on-site environmental management)



- Challenges include consistent interpretation of the mandatory requirements and credits, qualifications of the assessors, and distinction between Green Shores™ accreditation and legislative permitting and approvals.



3 PART 2 – BREAKOUT SESSIONS

The second part of the workshop included small breakout groups to discuss a series of topics related to NNBFs. The key findings from each breakout are summarized.

3.1 Where and When NNBF will Work, Scudder Mackey

The discussion on impediments to nature based shorelines and design considerations included the following summary points:

- Discussed impediments to nature based shorelines, including lack of proven methods and pilot studies, limited knowledge of options and benefits, and regulatory challenges
- On the Canadian shoreline, typically property-by-property management of erosion hazards, since there is no Coastal Zone Management Act to provide guidance for a big picture approach
- Citing criteria i.e., low versus high energy is critical, shallow embayment and gently sloping are ideal for wetland restoration. The physical structure of the coastline drives the types of NNBF projects you can implement
- Wetlands are often the default restoration option of choice but certainly not the only option
- Planning includes abiotic, biotic, and community/cultural considerations
- Requires consideration of regulatory climate, governance structure, and agency approvals
- A guidance documents on “what will work where” is needed. Important to understand existing and desired function of the project. Newer examples include integration in port and harbour infrastructure, island creation, and behind breakwaters. Ice is a really important design consideration
- Scale is really important. Move away from property-by-property management to larger stretches of coastline, even on a littoral cell basis

3.2 Existing Examples and Potential Future Case Studies, Gene Clark

The group focused on demonstration sites, including thoughts on where pilot projects would be successful:

- Take a systems approach, understanding littoral cell boundaries and long-term shoreline trend (i.e., erosion, stable accretion)
- Divided opportunities into high and low energy coastline. High energy locations:
 - Focus on littoral sub-cells, where there are some structures and some unprotected
 - US Army Corps of Engineers (USACE) port infrastructure is failing and requiring maintenance. Use smaller stones and gentler slopes, incorporate habitat features



- Island creation has significant potential, providing habitat within but also creating low energy sheltered areas
- Low energy coastlines:
 - Embayments, drowned rivermouths, sheltered areas behind infrastructure, such as ports
 - USACE port infrastructure is failing and requires maintenance. Could use smaller stones and gentler slopes in the repairs, plus incorporate habitat features

Next steps to implement a pilot project

- Requires funding
- Need partnerships and multi-disciplinary teams
- Suitable regulations
- Incentives are needed. For example, if utilize living shorelines, drop a portion of development fees if ecological targets are met
- Sites: need large stretch of coastline, preferably on public lands
- Who should be involved: resource management agencies, consultants, contractors, local officials/municipal governments, regulatory agencies, land owner groups/associations (avoid lot by lot, work with a group), parks and recreational departments (easier than private), Homeowner Associations, First Nations.

3.3 Research Needs for NNBF, Bryan Hinterberger

The following research needs were identified for NNBFs:

- Education and Culture: need a social shift in thinking
 - Need to figure out what communities need and want to know
 - Need to train new professionals working on the coast
 - Target training in post-secondary
 - Citizen scientists may be able to collect information
- Research Based
- Design Standards are needed and could use a risk framework
 - Quantify the approximate design life of the different features
 - Standardize with design manuals to assist professionals
 - Protocols related to design standards
 - Understand seasonal differences, including ice conditions and summer growing season for vegetation
- Cost Benefit Analysis:



- Traditional cost-benefit analysis needed, but also need to also look at socio-economic benefits, ecological goods and services (full ecosystem considerations)
- Long-term Planning
 - Need to understand system evolution, how best to select type of treatment
 - Incorporate maintenance and understand needs/costs. Embrace adaptive management approach to account for future uncertainty

3.4 The Role of Protected Areas and Opportunities for Expansion, Scott Parker

Scott's breakout focused on how to increase the acreage of natural areas:

- Need to build networks embracing systems thinking. The Baja California to Bering Sea Priority Conservation Areas is a good example of marine conservation at the continental scale. Need to link large geographic areas together, using:
 - Systematic approach to planning and establishment
 - Collaboration for management and monitoring (e.g., biospheres)
 - Awareness and participation
- Involve indigenous people in all aspects, including co-management
- Fisheries management community is almost always separate to the protected area management (land based). Need to bring them together
- We don't have a lot of examples of protected area management benefits. Need to do research on socio-economic benefits, document benefits and justify
- Conservation Biodiversity Target: 17% of terrestrial lands protected, 10% of marine and coastal systems protected by 2020
- Complete governance gap analysis to understand why our current structure has delivered the level of protection we have and what is needed to do better

Where are the ideal locations to show social, economic, and biodiversity benefits of no development?

- Learn from others regions (e.g., Great Barrier Reef, Australia)
- Within existing protected areas (e.g., national parks)
- Large ecosystems spanning International borders
- On conservation easements
- First Nations lands, since there are large tracks with single ownership



3.5 Knowledge Dissemination to Land Owners, Designers, Contractors and Regulatory Staff, Kate Hayes

Approaches to disseminate knowledge and how to promote NNBF were discussed by Kate's group:

- What doesn't work: long documents and reports that are not tailored to audience. Bringing people to venues and overloading them with information is not useful. Low retention of information and knowledge
- Children's book and mascot is one option. Better to engage youth early. High school students for youth corps. Then, they could go out and train other youth
- Train the trainer. Get a champion. Takes time to build up trust.
- Videos are good at spreading the message, especially via social media
- Not enough information dissemination can result in community backlash, so really important to do this at all stages of a project
- Developers: difficult to get them to do the right thing. Celebrate the ones who do the right thing. Try to get peer-to-peer influence.
- Terminology: can introduce confusion. What do we call it? Living shorelines, nature based shorelines, sustainable shorelines? Words are very important, so pick them carefully.

3.6 Integration of NNBF into our Regulatory Frameworks, Sandra George

Sandra's group discussed the topic of integration of NNBF in our regulatory framework:

- Regulations, policies and legislation. Need to look at regulatory framework and decide what we can easily implement. Go after the low hanging fruit. Policy documents are regularly updated, so try to integrate the concepts into updates
- Environmental Assessments and Cumulative Effects Assessments: They may be an alternative for integrating NNBF into solutions
- Barriers and challenges: Change happens slow, so be strategic and patient
- Shoreline Planning in Ontario is not integrated. The CAs have a mandate to focus on hazard mitigation and are not supported by natural resource ministries working in the same geography (e.g., Department of Fisheries and Oceans, Canadian Wildlife Service, and Ministry and Natural Resources and Forestry).
- Lack of capacity at some CAs and Municipalities in Ontario, especially the small rural ones
- Pilot Locations: we need examples to point to success stories, then work on regulatory



- Enforcement and Compliance: We rarely follow up on approved and constructed projects, which would be needed for NNBFs
- Goals and Objectives: where do we use these concepts? For rehabilitation and restoration, makes perfect sense. For coastlines that feature high functionality, probably doesn't make sense.
- Next Steps: incorporate concepts into legislation. Guidance manuals. Nearshore Framework and Lakewide Management Plans can be discussed and promoted. Look for funding opportunities



4 PART 3 – NEEDS AND OPPORTUNITIES FOR A COMMUNITY OF PRACTICE

The workshop concluded with a discussion on the needs and opportunities for a community of practice to advance the implementation of NNBF concepts for our coastal zones.

4.1 Summary of Discussion

Randy French facilitated the final session to answer a series of questions and further explore what COP could be, gauge the level of interest and support, discuss governance, and establish next steps. The key summary points from the discussion are organized by the various questions.

What is a Community of Practice?

- Knowledge hub and sharing network
- A place to get information in a centralized location. Share best practices. Review case studies on NNBF successes and challenges

Is there general support for a Bi-national Community of Practice?

- Amongst the meeting attendees, there was support for a Bi-national COP to advance the implementation of projects featuring NNBFs
- The majority supported a COP for all coasts, not just a specific region such as the Great Lakes. Sub-COPs could explore regional themes, such as design for sea level rise and integrating ice forces in the design

Is there a need? What are the benefits and functions?

- COP would be a place to solve problems. Create a shared vision and raise awareness with professionals, public, contractors and government. Foster cross-connections with people and knowledge sharing
- The COP could explore what alternatives will work in specific geographies, such as Great Lakes versus St. Lawrence River versus marine coasts of North America. Assist with communicating progress on science issues and implementation
- Integrate professionals together from different disciplines, identify research needs and build capacity
- Leverage funding opportunities to do more. Bring people together with common goals to share costs and execute pilot projects
- The COP could become an authoritative voice on the issues, which can support and substantiate government initiatives. Provide support for grant writing. Weight of multi-



nation COP to support research projects (advocacy role). The COP could also help advance governance and policy review

- COP could screen regulatory frameworks for provinces and states to determine which ones are the most successful at promoting nature based shorelines. To implement projects, we need a supportive policy framework
- Track ecosystem benefits over time. Do before and after construction/implementation comparisons. Monitoring is key to develop data and evidence to gain support for the NNBFs
- The consideration of ice-cover has not been explored with projects in southern US, so this could be a key focus (i.e., successful NNBF for ice-covered waters)

Are there any disadvantages?

- No disadvantages were identified

What would it look like? What would it do?

- Pull people together with shared vision for better coastal management
- Issue based ad hoc multi-disciplinary framework providing knowledge and tools to advance implementation of NNBF projects
- Similar to the Coastal-list, it could include a discussion board where members post/answer questions
- Group of experts from many fields that embrace NNBFs. Be honest about successes and failures
- Web portal to assemble information and disseminate to members. System would also be open to help people that are non-experts

How is it governed?

- Will need leadership to structure and govern. A group is required to provide management functions or secretariat role
- Need a core group of individuals to make initial advancements for the COP. Must take a series of small but calculated steps to setup the COP for future success
- What agencies should be involved? Look at those managing shorelines (federal, state, provincial, Sea Grants, conservation authorities, municipal governments). Put the responsibility on the regulators, so they can guide proponents. The COP could provide solutions to alternatives. Federal Fisheries Act is a major piece of legislation in the Great Lakes that influences almost all shoreline development and maybe DFO could be a sponsor



- Need to differentiate between a sponsor(s) who could bring money and the entities that would run the COP. Avoid government bureaucracy in the management of the COP. The group needs to be an independent voice, not tied to regulatory agencies.
- Canadian Coastal Science and Engineering Association was independent but then it was linked to a Federal Agency and it died. Too many rules. Lake Erie Millennium Network is sponsored by ECCC but is run by four entities: 1) University of Windsor, 2) Ohio Sea Grant and Stone Laboratory, 3) National Water Research Institute, and 4) the US EPA
- Who is responsible for the Canadian coastline? It is a number of different agencies, in Canada, no-one is responsible solely for the coast. Decision making is very fragmented. We don't have a program or one agency responsible for the coasts. In the US, there are the Federally mandated but State run Coastal Zone Management Programs.
- Don't become too reliant on a single government agency for funding. Also look to corporate sponsors (e.g., Industry, Banks) and Foundations. Ideally develop a stream of different funding sources
- The Coastal Zone Canada (CZC) Association is a non-profit charitable corporation run by a Board of Directors. They could run or co-run the COP. CZC advocates for integrated coastal management and in some ways, they are already a COP
- Sponsors bring resources and funding to get the COP started and they don't have to be the agencies that have regulatory authority
- The International Joint Commission is bi-national and work on the boundary waters between the two countries, so a potential partner. But their focus on trans-boundary waters doesn't include the marine coasts
- Governance structure, such as an advisory board or board of directors, needs to be resolved in future meetings
- Will need to determine how you moderate questions and answers if there is a list server? The Coastal-List, for example, has someone that screens and verifies all questions and answers. This is critical to keep the content professional, accurate, and reliable
- Some form of membership is good to filter out individuals with ulterior motives or focused on providing non-constructive feedback. Could be free but you would have to submit your e-mail and credentials to be approved
- Develop tools not rules
- Ensure the free flow of information. Organic. Informal, non-government
- Nature based shoreline could be the COP with sub-groups (sub-COPs)



- Look at European examples and models (e.g., European Commission). Integrated Coastal Zone Management (ICZM) is legally mandated

What are the next steps?

- Need seed money but must be really clear about the mandate. Write a document to make a pitch but have a really focused plan. Take small steps that are achievable
- We don't have everyone in the room. More disciplines. Decide who needs to be involved and lead (don't put too much pressure on one organization). Want the broad spectrum of professionals (Working Groups)
- Define what the terms NNBF, living shorelines, nature based shorelines mean
- Make sure there isn't already a COP, check the landscape (Sagecoast.org is a US COP)
- USACE, Engineering with Nature program has strong linkages
- Restore America's Estuaries already has a list server and is sharing information
- Requires a core group dedicated to the COP. Must identify
- CZC is already a COP, NNBF is a sub-set of the cause
- Host follow-up meetings, webinars to advance the COP ideas. Need to carry on the conversation
- Need to understand 'outcomes'. Where do we want to go? To implement projects, we need landowners, contractors, and regulators. So ensure we have everyone involved. Define the problem we want to solve
- The Zone newsletter could be used to spring board COP
- Training will be key in the future. Natural channel design is a good example, wasn't prominent several decades ago. People started pushing the concept, it grew, now it is standard practice
- Living Buildings (International Living Future Institute) started small but promoted a powerful message. Have been successful at changing building standards/codes. Could follow their model
- Will move forward as a group to explore options for a bi-national effort



5 FIELD TRIP

Gord MacPherson from the Toronto Region Conservation Authority lead a group of 22 individuals on a field trip the day after the NNBF workshop. The bus trip included stops to observe the existing conditions of the Keating Channel (site of the planned Don River Mouth restoration), explore the wetland restoration and alternative shoreline edge treatments at Tommy Thompson Park, view the large recreational sand beach at the Eastern Beaches, learn about the history of Bluffers Park and the numerous components of the large lakefill park, and witness the channel stabilization project and dune restoration at Frenchman's Bay. The location of the field trip stops is noted on the adjacent map.



A photograph of the field trip participants at Tommy Thompson Park.





REFERENCES

USACE, 2015. Use of Natural and Nature-Based Features (NNBF) for Coastal Resilience. Prepared by the Engineering Research Development Center, US Army Corps of Engineers.



APPENDIX A

WORKSHOP PRESENTATIONS

(not appended to this version of the report)



APPENDIX B
WORKSHOP ATTENDEES
(partial list)



Individual	Organization
Beryl Allen	West Coast Landscape Architect
Susan Davidson	Seas Science Inc
Mike Molnar	Indiana DNR
Gene Clark	University of Wisconsin Sea Grant
Heather Weitzner	NY Sea Grant (now OBG)
Julia Hatcher	ECCC
Mike Shantz	ECCC
Judy Sullivan	Aqua Solutions 5 Inc.
Patrick Ragaz	Mohawk Council of Kahnanaike
Julia Dean Rosati	USACE Coastal and Hydraulics Lab
Lynden Penner	JD Mollard & Associates
Bryan Hinterberger	USACE
Rosmarie Lohnes	Helping Nature Heal
Sandra George	ECCC
Ken Thajer	CVCA
Ranka Basic	CVCA
Phil Osborne	Golder Associates
Jeff Doucette	GHD
Erinn Lawrie	Lake Huron Centre for Coastal Conservation
Rhiannon Moore	Lake Huron Centre for Coastal Conservation
Kate Hayes	CVCA
Vincent Leys	CBCL
Kristen Wozniak	Ducks Unlimited Canada
Deborah Brooker	OMAFRA
Janette Anderson	ECCC
Alexi Baccardax Westcott	COIN Atlantic
Pete Zuzek	Zuzek Inc.
Randy French	French Planning Services
Scott Parker	Parks Canada
Gord MacPherson	TRCA
Scudder Mackay	Ohio DNR Office of Coastal Management