

TRIECA | CONFERENCE



3rd Annual TRIECA Conference – March 25 & 26, 2014
www.trieca.com

Thank you to all of our TRIECA 2014 Sponsors!



Media
Partner



THINGS I DID NOT KNOW ABOUT NATURAL CHANNEL DESIGN



PRESENTER: BRIAN GRECK, P.ENG

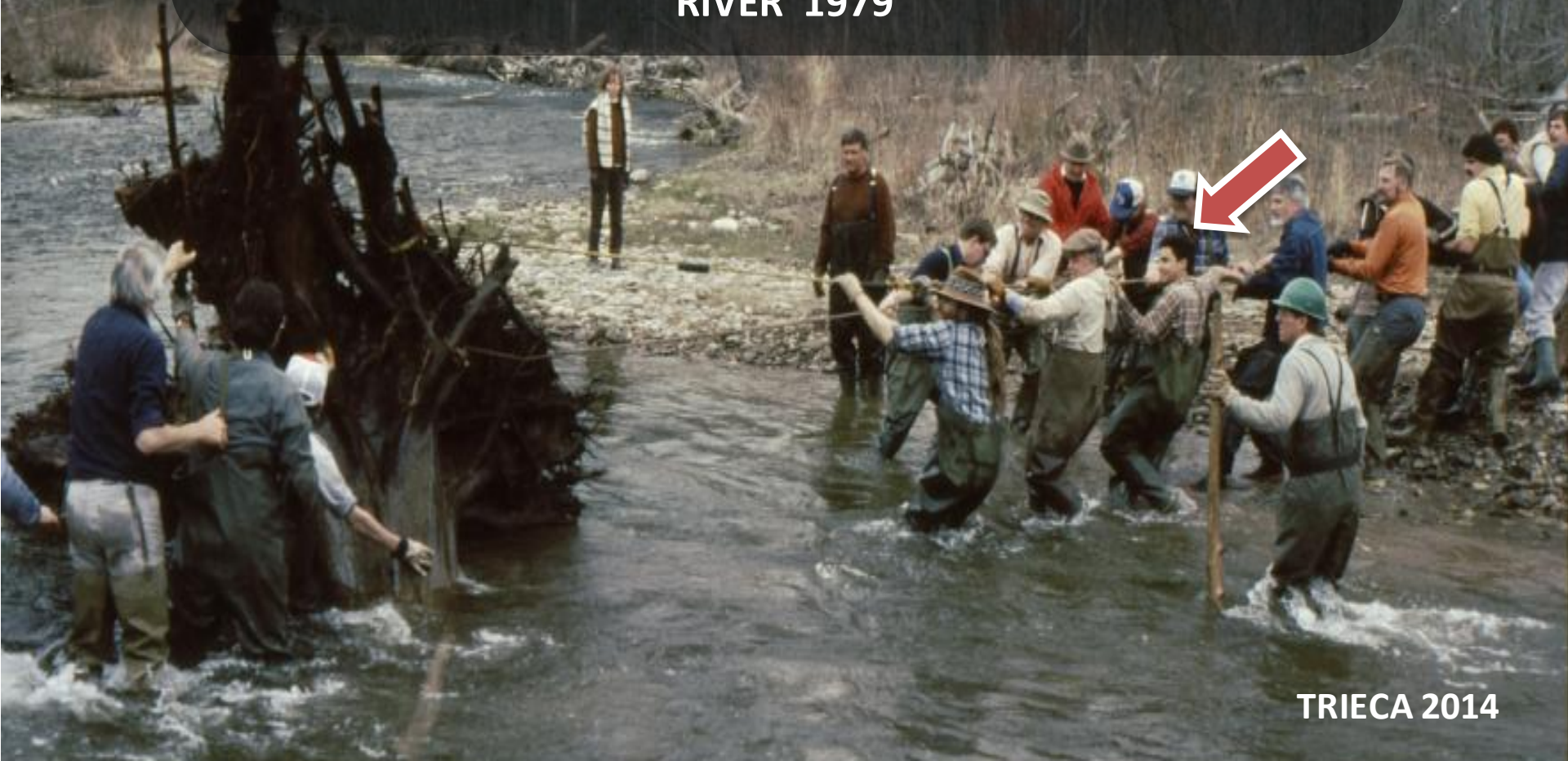
TRIECA 2014

A long-exposure photograph of a river flowing over mossy rocks in a forest. The water is blurred, creating a sense of motion, while the rocks are sharp and covered in vibrant green moss. The surrounding forest is dense with green foliage.

A REVIEW OF PROJECTS INVOLVING THE APPLICATION OF NATURAL CHANNEL DESIGN CONCEPTS FOR PRIVATE, PUBLIC AND NGO INTERESTS

THEY ARE NATURAL CHANNELS GOING IN SOME
DIRECTION. IT'S A BALANCE BETWEEN FLOW AND SEDIMENT
DYNAMICS, VEGETATION, AND FORCE OF VEGETATION
WATER AND THE RESISTANCE OF THE LAND IT FLOWS
ACROSS

**YOU HAVE TO START
SOMEWHERE! MOVING LARGE
WOODY DEBRIS THE HARD WAY
WORKING FOR TROUT UNLIMITED CANADA (NGO)- CREDIT
RIVER 1979**



TRIECA 2014

WHY WERE WE DOING IT?

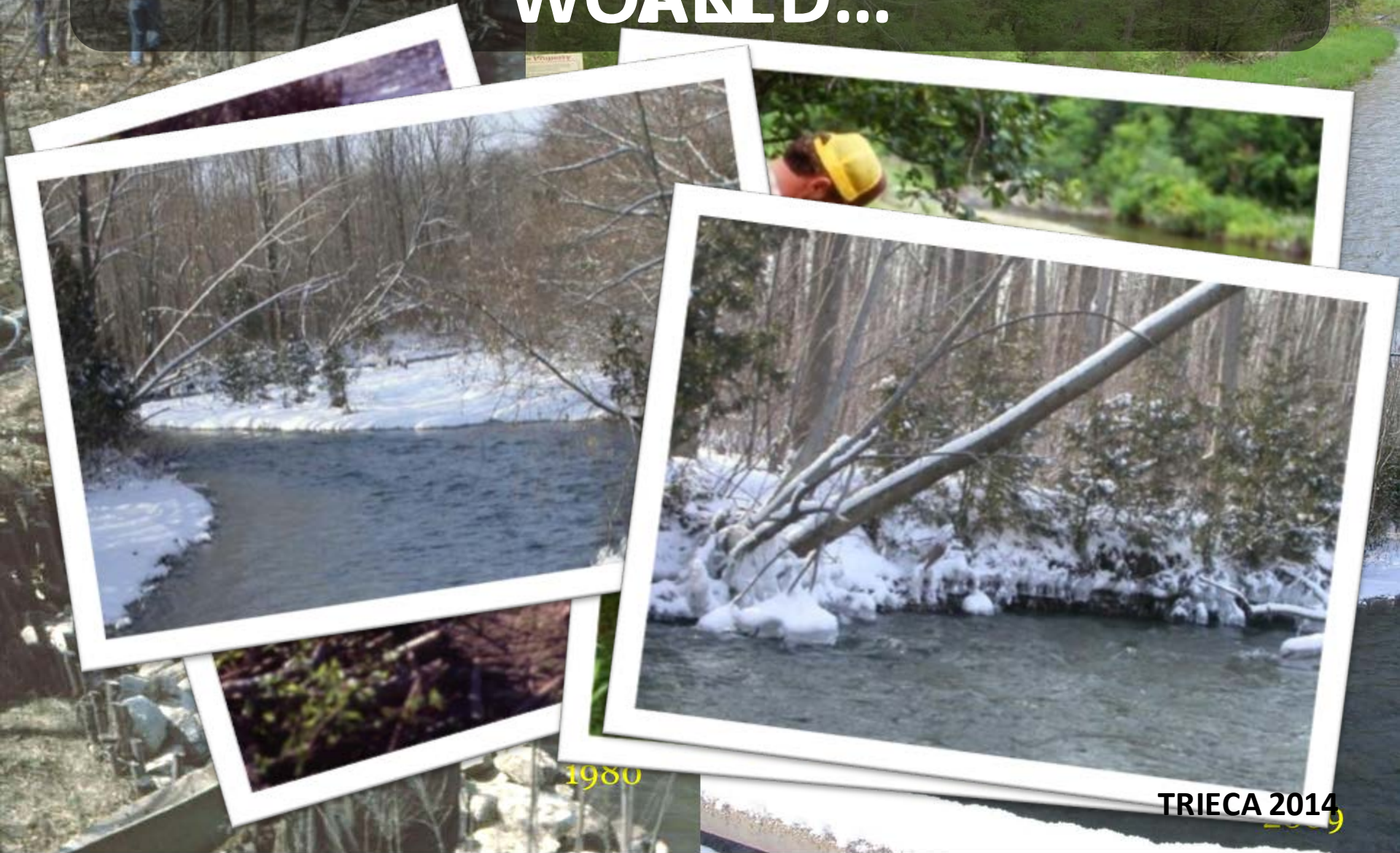
TO CATCH FISH?



**ALL SORTS OF NATURAL EROSION CONTROLS WERE
BEING IMPLEMENTED** BEFORE NATURAL CHANNEL DESIGN, FLUVIAL
GEOMORPHOLOGY OR SOIL BIOENGINEERING WERE COMMON TERMINOLOGY



SOME THINGS WORKED AT
SOME THINGS WORKED...
WORKED...



1980

TRIECA 2014

LESSONS LEARNED



- Educate and supervise your work crews and volunteers
- Explore and try new ideas
- Learn from your mistakes
- Be patient, nature has a way of refining your work

NATURAL GAS PIPELINE CORRIDOR

NATURAL CHANNEL REALIGNMENT OF A BROOK TROUT STREAM (1998)



LESSONS LEARNED



- Use a team approach with experts in their respective fields.
- Ensure plans are understood by members of the project team including site inspectors and the contractor
- Hire contractors with expertise in specialized components such as soil bioengineering.
- Natural channel designs does not mean uniform even riffle pools plan form.

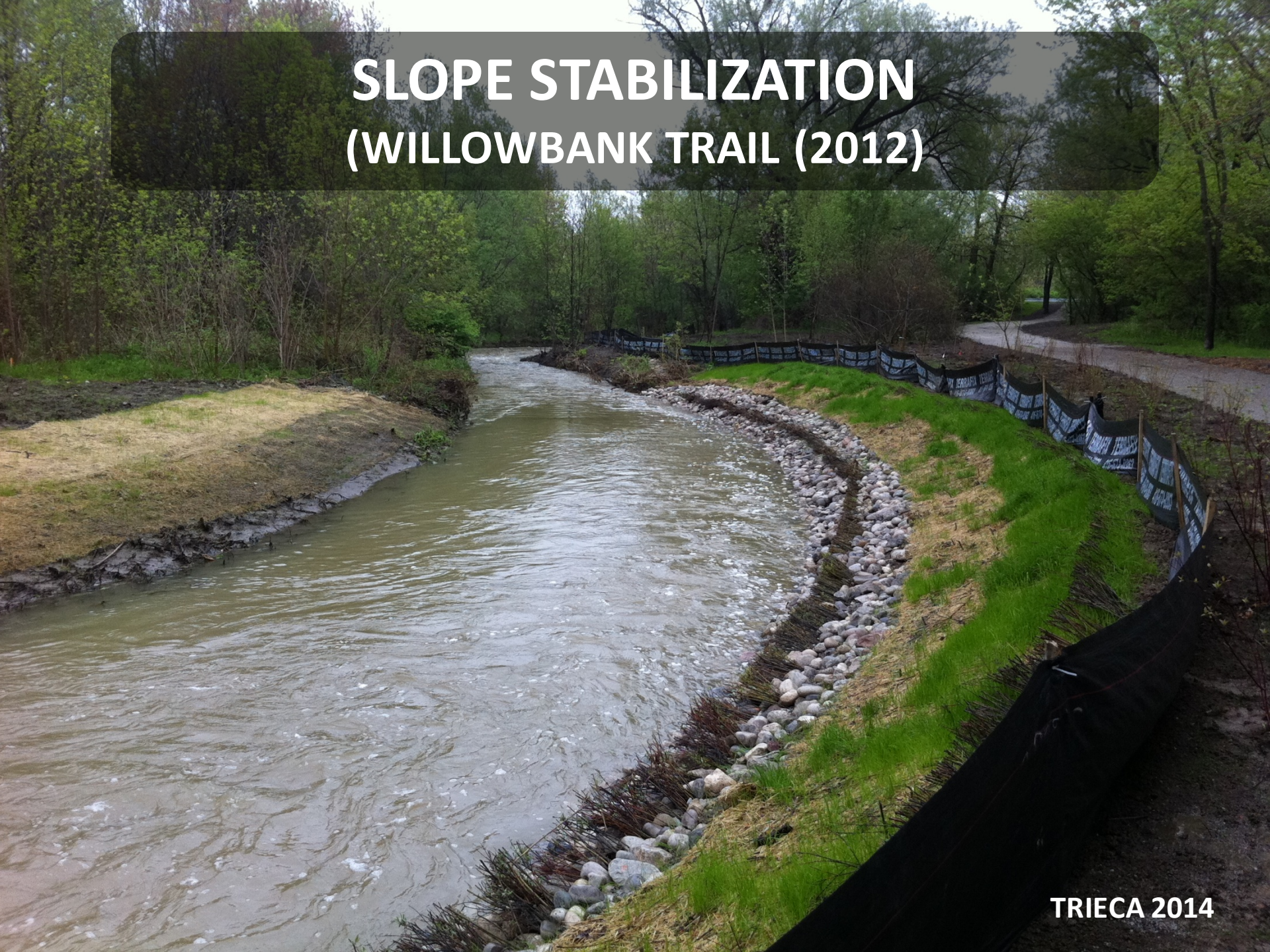
CHANNEL RESTORATION AND SLOPE STABILIZATION, HUMBER RIVER(2004 & 2008)



2004

TRIECA 2014

SLOPE STABILIZATION (WILLOWBANK TRAIL (2012))

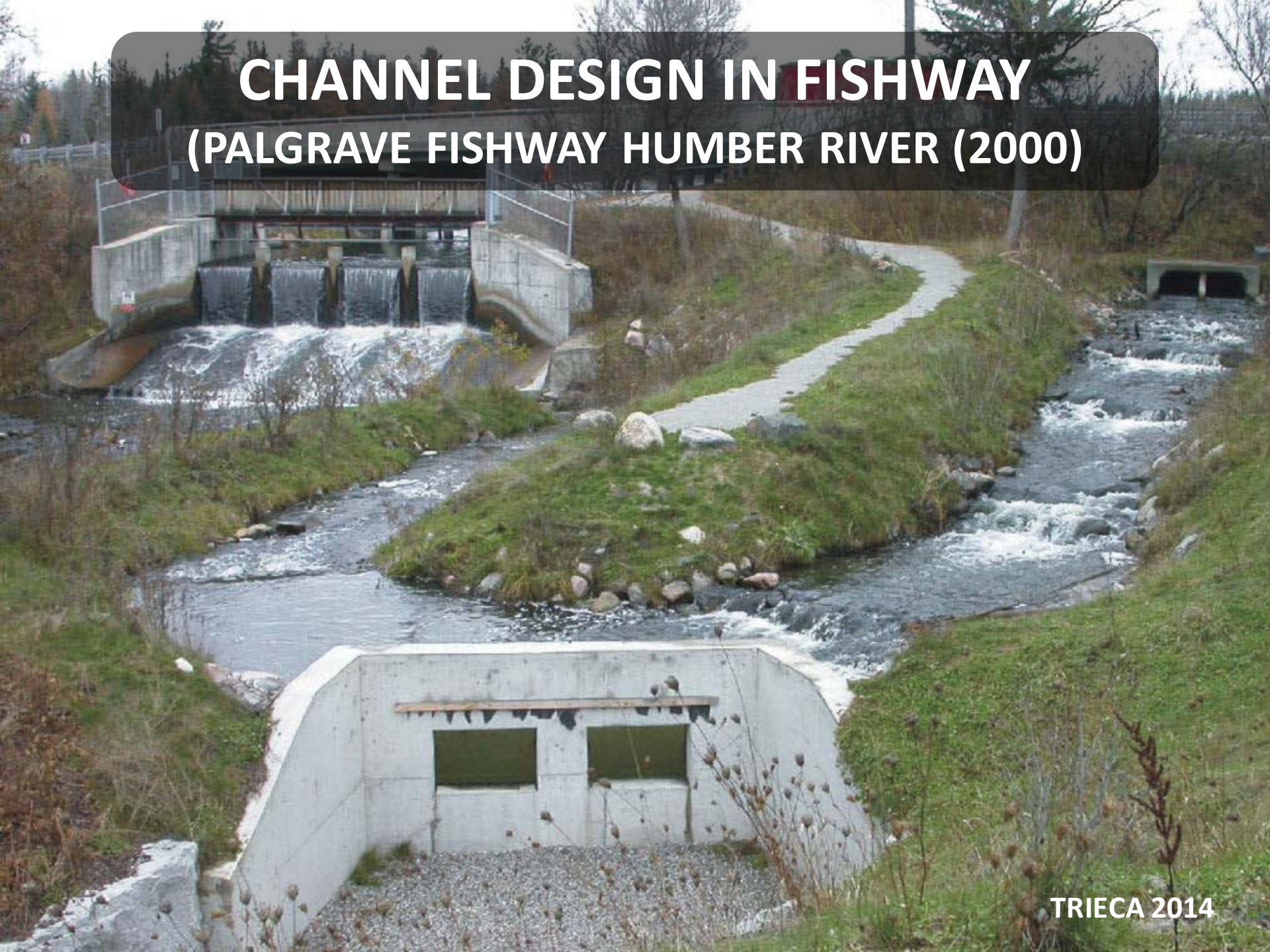




LESSONS LEARNED

- With and understanding of channel form and function you can better select the application and material for channel erosion control measures.
- Pay special attention to the selection of soil bioengineering techniques, e.g. soils nutrients, moisture conditions, plant dormancy and timing for implementation
- Ensure the construction managers approves of design changes and methods suggested by the contractor.
- Ensure the materials specified can be readily obtained by the construction contractor.
- Post construction inspection and monitoring is required to ensure constructed works are functioning as planned.

CHANNEL DESIGN IN FISHWAY (PALGRAVE FISHWAY HUMBER RIVER (2000))



CHANNEL DESIGN IN FISHWAY (BOWMANVILLE CREEK NEW FISHWAY (2013))



TRIECA 2014

LESSONS LEARNED



- Make sure the design plans are complete, understood and the construction is supervised.
- Build in safety factors when design components (such as grade in this case) are important.
- Closely monitor projects which provide unique functions or design components.
- Complete the planning, design and approvals phases in a timely and efficient manner as project funding for special projects is often time limited.

ADAPTING NATURAL CHANNEL DESIGN IN A CULVERT (WILSON ROAD 2006)



LESSONS LEARNED



- It may not be possible to achieve all objectives to the fullest extent desired. Natural channel design involves getting a balance of desired priorities with constructability and costs.
- Design plans which anticipate future change may not achieve short term expectations. Static structures may not provide sufficient flexibility to accommodate natural channel dynamics.
- The lack of success in one project may be inspiration for new ideas.

ADAPTING NATURAL CHANNEL DESIGN IN A CULVERT

(BRITANNIA AVENUE 2012)



2012/10/04

TRIECA 2014

CHANNEL RESTORATION (MARDEN CREEK AND IJC DAM REMOVAL (2010)



LESSONS LEARNED




- Team work between the proponent, regulatory agencies, stakeholders, consulting team, the contractor and public are important.
- Interpretation of regulations, as they may apply to sediment control, should be based on potential risks for environmental impact.
- The cost-benefits of sediment control need to be balanced with net potential benefits to the environment
- Given the right conditions natural channels can form and stabilize themselves rapidly.

KEY POINTS TO REMEMBER ABOUT NATURAL CHANNEL DESIGN!

- 1. STABLE NATURAL CHANNELS SYSTEMS ERODE. THEY BECOME A PROBLEM WHEN WE ACCELERATE THE NATURAL PROCESS AND WHEN THEY CONFLICT WITH OUR WANTS OR NEEDS.**
- 2. IF YOU CONTROL ALL EROSION IN A CHANNEL IT MAY BECOME UNSTABLE**
- 3. NATURAL CHANNEL DESIGN REQUIRES INSIGHT AND EXPERTISE FROM A VARIETY OF DISCIPLINES**

KEY POINTS TO REMEMBER ABOUT NATURAL CHANNEL DESIGN!

- 
- A photograph of a fish, possibly a trout or salmon, swimming in a natural channel. The fish is positioned diagonally across the frame, moving from the upper left towards the lower right. The water is clear, revealing a rocky riverbed with various sized stones and pebbles. The lighting is warm, suggesting a sunset or sunrise, with golden light reflecting off the water's surface and the fish's scales. The overall scene conveys a sense of a healthy, natural aquatic environment.
4. THERE IS NO EQUATION FOR THE PERFECT NATURAL CHANNEL DESIGN
 5. PAY ATTENTION TO THE DETAILS
 6. MAINTAINING A STRONG WORK ETHIC FOR ALL PHASES OF A PROJECT
 7. THINK OUTSIDE THE BOX, LOOK FOR OPPORTUNITIES
 8. CONTRACTOR HAVE GREAT EXPERIENCE LEARN HOW TO USE THEIR SKILLS



**In conclusion, as practitioners
in the field of natural channel
restoration, there is much that
we can learn from each other.
Never stop learning.**

Thank you



GRECK AND ASSOCIATES LIMITED
WATER RESOURCES AND ENVIRONMENTAL ENGINEERING