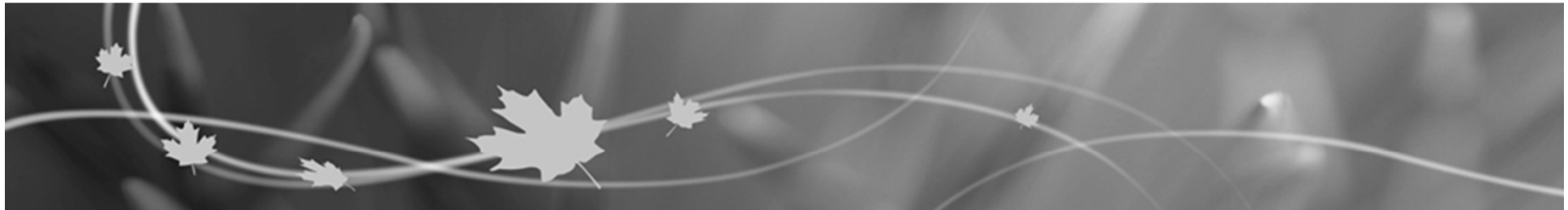




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# **Waste Prevention Audits for Wood Waste**

**Science Day 2017**

**London, UK**

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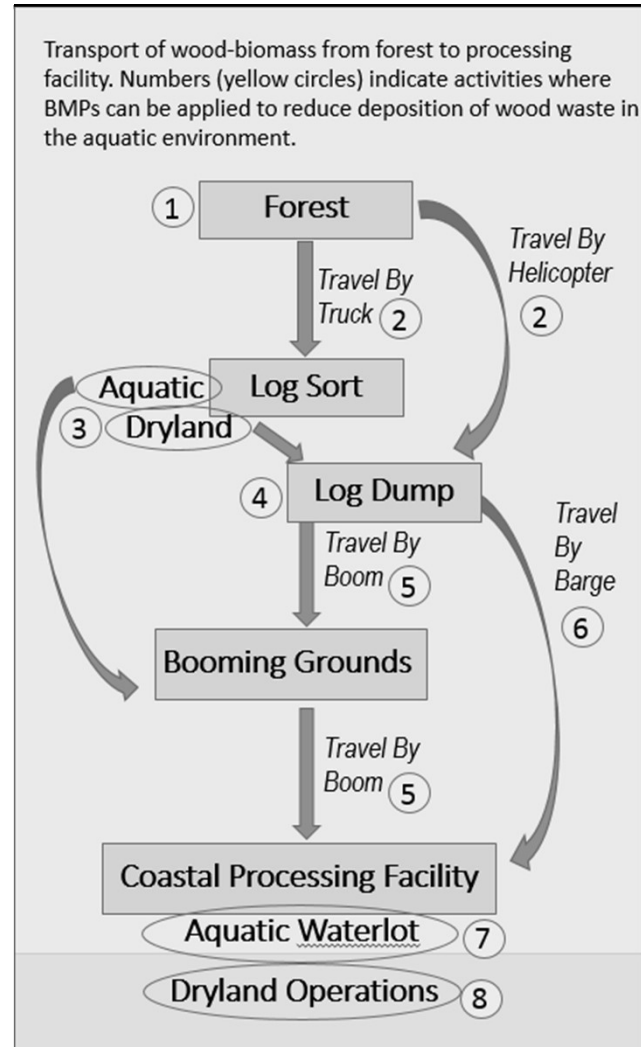
**March 30<sup>th</sup>, 2017**

# What is a Waste Prevention Audit?

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- A consideration of whether there are opportunities to prevent or avoid the creation of the waste in the first place
- This is followed by an alternatives assessment, looking at various management options
- The two assessments are related, but they each have a unique objective

# Context - wood waste generation



- Wood waste results from the wood processing industry
- It can be generated at all stages of log handling and transport in the journey from forest to processing facility

# Wood waste enters the sea from ...

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Log handling facilities\*



Manufacturing facilities



Wood fibre handling facilities

# Context – wood waste in Canada

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- Disposal permits requested by site owners or operators that require dredging of their water-lots
  - Log-sort facilities - require annual dredging
  - Manufacturing facilities – dredged every 2 years or more
  - Fibre handling facilities – dredged every 5 years

# Context – wood waste in Canada

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- Dredged material from these wood-handling sites may contain wood waste (alone or mixed with sediment)
- 50,000 m<sup>3</sup> to 120,000 m<sup>3</sup> per year typically disposed of at one of a few disposal sites on Canada's west coast



# Purpose of Study

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- When applying for a disposal permit, applicants must attempt to reduce the overall amount of waste intended for disposal (and assess management alternatives)
- Wanted to explore the potential to do more to prevent the introduction of wood waste to dredged material (and to assess alternatives to disposal once it's there)
- Presenting results of work just completed to improve waste prevention audits for wood waste



# Approach / Methods

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## 1) Review of Potential Impacts of Wood Waste at disposal Sites

- Literature and monitoring data

## 2) Review of Disposal Permit Applications and supporting material

- 70 permits including wood waste from January 2011 to October 2016
- to identify waste prevention measures and alternative disposal/re-use options considered or implemented

## 3) Review best management practices (as well as re-use options)

## 4) Interviews x 34 including:

- Load site operators / permit holders (13 interviews; 17 facilities)
- Alternative use service provider (n=12)
- Industry regulator/association/expert (n = 6)
- Consultants (n=1)
- Miscellaneous (e.g. transport company) (n=2)





# Results– Effects Monitoring

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- **Currently-available evidence for six DaS sites suggests that there are no gross adverse impacts resulting from wood waste disposal**
- Wood waste is present in trace to scattered amounts, and not at all stations
- Still some uncertainty around organism exposure to products of decomposition
- Also, most data from grab sampling, which tends to fail in presence of wood debris.



# Results– Status Quo

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- Overwhelming majority of applications reviewed did not provide useful information relevant to reducing wood waste
- None of the applications provided any indication if/how the proponent had considered means of reducing the amount of wood waste at the dredge site
- Waste audits appear to have been misinterpreted by proponents, because the top three responses were:
  - a statement that the waste audit is not applicable
  - a promise that details will follow prior to loading, and
  - a brief explanation of why disposal is the most feasible disposal method



# Results– Waste Reduction

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- Effective BMPs exist at each log handling and transport stage
- These can reduce the amount of wood waste that enters the marine environment
- They are generally specific to the type of site where wood waste is generated, or are applicable at earlier phases in the log handling and transport process (i.e., in the forest).

# Results– Forest BMPs

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- Bark removal
  - Reduces weight, saves transport costs
  - Can reduce log buoyancy, increase damage and handling time
  - Drawbacks can be addressed through barge transport (costly)



# Results– Forest BMPs

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- Leave debris in the forest
  - Improvements to limbing (removing tree branches) and bucking (removing the log ends) practices are needed in all operations
  - Estimate that these practices can reduce amount of waste arriving from forest by 10%



# Results– Log Handling BMPs

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- Bundle logs together to reduce battering and chaffing
- Logs should be bundled on land, not in water, where practical



- Surcharge to customers for surplus wood waste arriving from woodlands
  - disincentive reduces the amount of wood waste that requires handling

# Results– Log Sorting BMPs

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- Sort on land to reduce log damage and waste entering water and use enclosed loading belts
- Berm around outer edge of the sort surface to contain waste
- Pave sorting yards to ease wood waste removal and stormwater management
- Avoid operating procedures that include pushing debris into the marine environment.



# Results– Log Dumping BMPs

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- Place logs into water gently (avoid high drops, use A-frames etc)
- Catch debris under let down device (e.g. basket or net)
- Break log bundles on land
- Daily removal of wood debris accumulated on site, in tidal areas
- Booms designed to catch floating debris (i.e. with an upright fence)



# Results– Boom Transport BMPs

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- Bundling, limbing on land, booms that contain debris, setting boat wake limits, and monitoring to ensure that logs do not sink



# Results– Barge Transport BMPs

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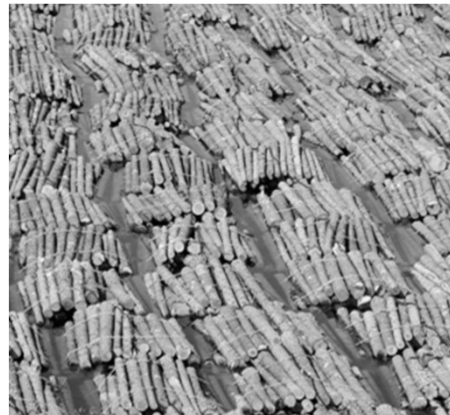
- Load and unload to prevent breakage (low speed)
- Collect debris for land disposal
- Use debris-containing catch-sticks in dumping areas
- Repair barges to prevent loss of debris
- Catch debris that falls between barges and docks
- Avoid tipping directly into water
- Recover lost logs



# Results– Water Storage BMPs

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- Minimize storage (1 month maximum)
- Avoid 'grounding' (i.e. contact with seafloor, e.g. during tidal cycles)
- Recover tidally grounded logs immediately
- Monitor sunken logs in deeper water for coverage / decomposition and remove if needed



# Results– Use of BMPs

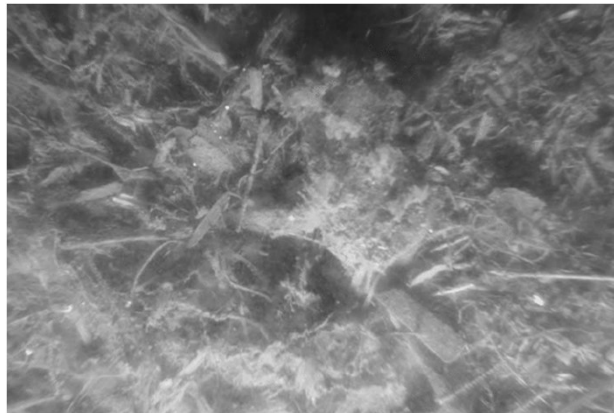
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- Extent of their use and the feasibility of additional BMPs is unclear.
  - Very little information provided in permit applications
  - Interviews suggest that many owners / operators are implementing some BMPs
- Implementation varies by type of operation and constrained by site design and location.
- No comprehensive understanding of which BMPs are used at which sites, and why other BMPs are not used.
  - Further information would be needed to identify specific opportunities for use of BMPs at specific sites

# Results – Use of BMPs

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- Dredging is a direct cost: can assume that operators likely implement BMPs where there is an obvious net economic benefit.
- Interviews with operators indicated that incentive to reduce wood waste is primarily cost driven
  - Dredging and disposal represents an expensive part of operations
  - Have little influence on the accumulation of material other than wood waste
  - Use soundings and videos before dredging to minimize need for over-dredging and associated disposal costs



# Results – Use of BMPs

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- Major challenge is cost
- “if economics were not paramount, the entry of wood waste into the aquatic environment could theoretically be nearly eliminated through the use of BMPs”



# How could we use these results?

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- A step-wise, informed approach to improving wood waste management



# How could we use these results?

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- Short-term: request specific waste prevention information from permit applicants to demonstrate use of BMPs; for example ...
  - *Amount and type of wood waste to be dredged (confirm & report)*
  - *Location and amount of debarking*
  - *Location of sorting and bundling (land or water)*
  - *Transfer of logs to sea (equipment used, debris reduction measures)*
  - *Measures to reduce debris during loading*
  - *Boom construction – designed to contain debris?*
  - *Upland containment measures*
  - *Debris minimization measures on barges*
  - *Measures for lost log retrieval and monitoring*
- Additional details should demonstrate use of BMPs, or trigger need to justify why BMPs are not used.
- Could also verify BMP use through site visits



# How could we use these results?

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- Information would improve understanding of BMP use, feasibility and costs
- Longer term: For particular sites or types of sites, evaluate potential benefits of policy measures or other steps to encourage use of particular BMPs (or alternatives to disposal)
- Use study results to more critically evaluate information provided in permit applications

# Thank You!

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