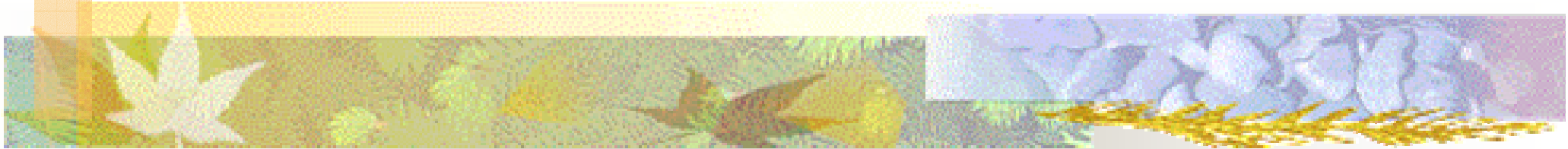


# Wetland Management for Nature



North America and Europe –Similarities and Differences

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# Hypothesis

- Since wetland management goals and objectives do vary between jurisdictions, it follows that the management focus should vary as well. For example, it may follow that in the highly fragmented and disturbed Western European wetlands, management practices tend to focus on rehabilitation of disturbed systems to (near-) natural states. However, North America may instead attempt to conserve its undisturbed wetlands and focus instead on practices such as artificial wetland creation. This is to meet the “no net loss of wetlands” principle, and to find ways to use wetlands functional processes ( e.g. wastewater treatment)

Goals / Objectives   ←————→   Management Focus   ←————→   Research



# Methodology

- Extensive literature search of last 10 years
  - Key words: Wetland Restoration, Wetland Management, Wetland Conservation
  - Web of Science
  - Approximately 300 articles
- Categorized the article's:
  - Main focus: Conservation, Restoration, Creation
  - Location of home university
  - Location of study site (if applicable)



# Results

- Difficult to discern any differences between North America and Europe
- Large range of topics in literature
  - from attempting to understand basic wetland processes and functions to modelling the effects of various complex management options on a watershed
- Much of North America is as fragmented and disturbed as Europe (i.e. Great Lakes)



# Problems / Challenges

- Majority of the research from the U.S.A
- Global world has removed the isolation that fostered continental differences
- Categorization of papers very subjective
- Little correlation between type of research conducted in an area and the area's wetland goals



# However...

- Literature was divided into four main focuses
  - Wetland Science: Understanding basic processes and functions.
  - Wetland Conservation: Where and how to conserve?
  - Wetland Restoration: Where and how to restore? Defining success and monitoring efforts.
  - Wetland Creation: What and where to create? How to mimic natural functional processes? Is it effective?





# Wetland Conservation

- Attempting to conserve existing natural wetlands, or conserving restored wetlands
- Ramsar Convention (1971)  
"the conservation and wise use of all wetlands through local, regional and national actions and international cooperation "
- North America - focus on conservation of pristine areas, interested more in animals
- Europe – focus on conservation of restored areas, interested more in vegetation



# Wetland Conservation Example

- *Wetland conservation and ducks unlimited: Real world approaches to multispecies management.*  
G.M. Tori, S. McLeod, K. McKnight, T. Moorman, F.A. Reid – Water Birds 25 : 226-121. 2002
- Over 65 years restored, protected, enhanced 4.05 million hectares in North America
- “Integrated habitat – based landscape approach to wetland restoration and management”
- North America - Conserving large natural areas then leaving them alone, otherwise active management in highly degraded areas





# Wetland Restoration

- Many areas of the world have highly disturbed/destroyed wetland systems
- “Generally, wetland loss is difficult and costly to reverse, and wetland restoration is an increasingly popular applied science and conservation tool” G. Weyembergh et al
- To reduce these high costs, in areas where wetland degradation is high, research will focus on restoration



# Wetland Restoration Example

- *Restoration of a small-scale forest wetland in a Belgian nature reserve: a discussion of factors determining wetland vegetation establishment.*

*G. Weyembergh, S. Godefroid, N. Koedam. Aquatic Conserv. Mar. Freshw, Ecosyst. 14: 381-394. 2004*

- “Main aim of this restoration attempt within a nature reserve was to create sustainable conditions for wetland species, particularly aquatic plants”
- “An essential prerequisite for successful restoration is a study of the past vegetation of the target site and its surroundings. ... provides an example of how restoration projects benefit from knowledge and understanding of historical and present conditions”
- Europe – Active management/restoration within a nature reserve



# Problems with wetland restoration

- Little is known about the long term progress of restoration
- Not a simple linear relationship from degraded to restored
- What is success?
  - When hydrological conditions are renewed?
  - When a certain vegetation community is established?
- Active management of restored areas, or not?



# Wetland Creation

- In North America much research is focused on the creation of artificial wetlands. This is driven by:
  - The “no net loss principle” in the U.S.A
  - Harnessing wetland functional processes
- In the City of Calgary all new large developments must include an artificial wetland for runoff treatment



# Wetland Creation Example

- *Improving the success of wetland creation and restoration with know-how, time and self-design*

W. Mitsch and R. Wilson. USA. Ecological Applications 6(1): 77-83. 1996

- “There is optimism that wetlands can be created and restored and that wetland function can be replaced”
- But... We need to: know more about wetlands, give them more time to establish and we should allow self design.
  - Self Design – allow nature to make the choices
  - Designer – akin to gardening or landscape architecture
- “Ecosystem level research and ecosystem modelling may provide better guidance on when created and restored wetlands can be expected to comply with criteria that measure their success”





# Problems with Wetland Creation

- *Effectiveness of compensatory wetland mitigation in Massachusetts*  
S.C. Brown, P.L.M. Veneman. *Wetlands*, 21 (4): 508-518. 2001
- “Majority of studies (54.4%) were not in compliance with the Massachusetts wetland regulation for a variety of reasons, including no attempt to build the project (21.9%), insufficient size or hydrology (29.8%)”
- *Natural and Constructed wetlands for wastewater treatment: Potentials and problems*  
B. Jopal. *Water and Science Technology*, 40 (3): 27-35. 1999
- Though wetland creation may be good for specific small tasks it should not replace wetland conservation and restoration





# Three management focuses used in different ways

Fragmentation

Area	Western Canada	Netherlands / East Coast US
Focuses	1. Conservation of natural habitats	1. Restoration of wetlands
	2. Creation of artificial wetlands	2. Conservation of restored wetlands
Indicators	Animal Habitat	Vegetation



# Conclusion

- No conclusive difference between North America and European management practices
- However trends do exist within the literature
- As the level of degradation/fragmentation increases the management focus changes



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Questions/Comments