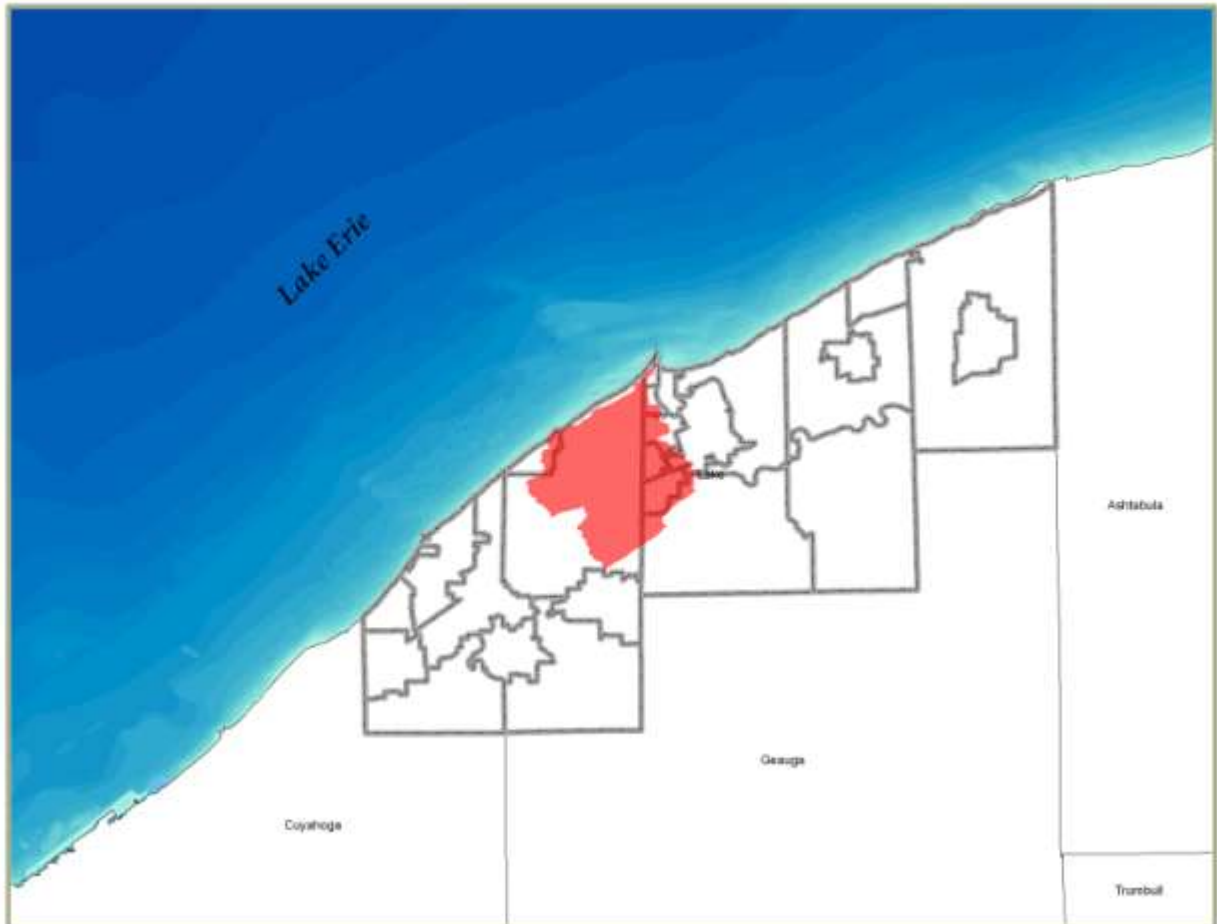


**DRAFT**

**Mentor Marsh Watershed Action Plan**



**Lake County Soil and Water Conservation District  
125 East Erie Street  
Painesville, Ohio 44077**

**(440) 350-2730 phone  
(440) 350-2601 fax**

**[www.lakecountyohio.org/soil](http://www.lakecountyohio.org/soil)**

**Contact: Chad Edgar  
[cedgar@lakecountyohio.gov](mailto:cedgar@lakecountyohio.gov)**



List of Tables .....	vii
List of Figures .....	viii
List of Graphs .....	ix
Appendices (on enclosed CD) .....	x
Acknowledgments.....	xi
Distribution List.....	xii
Endorsement .....	xiii
Calendar of Events.....	xiv
Mentor Marsh Watershed .....	1
General Characteristics .....	1
History of Mentor Marsh Watershed .....	1
Demographics .....	4
Previous Planning, Protection, and Management Activities.....	7
Marsh Area Regional Coalition (MARC) and Development of the Watershed Plan .....	10
Structure and Organization .....	10
Mission and Vision .....	10
Other Partners and Stakeholders .....	13
Non-Governmental Organizations .....	13
State of Ohio .....	13
Local/Regional Agencies .....	14
Federal.....	14
History.....	15
Watershed Plan Development.....	15
Implementation Plan .....	16
Landowner Survey .....	18
Inventory of Natural Resources .....	23
Physiography and Geology .....	23
Soils.....	27
Biological Features .....	45
Water Resources .....	46
11 Digit and 14 Digit HUC Watersheds .....	46
Climate and Precipitation.....	46
Streams, Subwatersheds, and Floodplains .....	47
Methods.....	53
Results.....	53
2006 Integrated Water Quality Report.....	55
Ohio Sport Fish Consumption Advisory.....	55
Wetlands .....	55
Lakes and Reservoirs .....	56
Groundwater Resources and Groundwater Pollution Potential .....	65
Existing Land Use and Predicted Trends.....	68
Impervious Cover.....	68
208 Water Quality Management Plans .....	71
Park Districts and Protected Property .....	75
ODNR-DNAP .....	75
ODNR-Parks and Recreation.....	75
Cleveland Museum of Natural History .....	75
Mentor Community Parks.....	75
Cultural Resources .....	77
National Register of Historic Places .....	77
Ohio Historic Inventory .....	87

Ohio Archaeological Inventory.....	95
Mentor Marsh Watershed Impairments and Problems Summary.....	96
Problem Statement.....	96
Water Quality.....	97
Point Source Pollution .....	97
Waste Water Treatment Systems – Low Priority / Urban (5.6.1) and (5.6.2) .....	97
Oil and Brine Storage Lagoons and Wells – Low Priority / Urban (5.3.2) .....	98
Salt Contamination – High Priority / Urban (5.3.2).....	102
Hazardous Waste Contamination – Low Priority / Urban (5.3.2) .....	103
Erosion and Sediment Control – Low Priority / Urban (5.3.2), (5.3.3), (5.8.1), and (5.8.2) .....	104
Home Sewage Treatment Systems (HSTS) – Low Priority / Urban (5.6.2).....	105
Impoundments and Dams / Hydromodification (7.4.1) .....	105
Land Use and Economic Development.....	107
Projected Growth – Low Priority / Urban (5.3.3).....	107
Uncoordinated Land Use Planning – High Priority / Urban (5.3.3) .....	108
Development Pressures – Low Priority / Urban (5.3.3).....	108
Wetlands and Biodiversity .....	109
Biodiversity Loss – High Priority / Urban (5.3.3) .....	110
Hydromodification – High Priority / Hydromodification (7.4.1), (7.4.2), (7.5.3), and (7.6.1) .....	111
Natural Disturbances – High Priority / Urban (5.3.2).....	111
Public Understanding and Attitudes – High Priority / Urban (5.3.2) .....	112
Recreation and Public Access .....	112
Lack of a Strategic Recreation Plan – High Priority / Urban (5.3.2).....	112
Negative Impacts of Public Access – Low Priority / Urban (5.3.3) .....	116
Public Outreach – Low Priority .....	116
Shoreline Management and Nearshore Issues .....	117
Insufficient Sand Supply – Medium Priority .....	118
Activities Landward of the Bluff Edge – Medium Priority .....	118
Watershed Restoration and Protection Goals .....	120
Water Quality Implementation Plan 1: Salt Contamination / Urban (5.3.2) .....	120
Activity 1 .....	120
Activity 2 .....	120
Activity 3 .....	121
Activity 4 .....	121
Primary Coordinating Agency .....	122
Participating Agencies, Organizations, and Entities .....	122
Costs.....	122
Timeline .....	122
Existing Programs .....	123
Public Outreach Component .....	123
Objective .....	123
Wetlands and Biodiversity Implementation Plan 1: Wetlands Mitigation / Urban (5.3.2).....	123
Activity 1 .....	123
Activity 2 .....	123
Activity 3 .....	124
Primary Coordinating Agency .....	124
Participating Agencies, Organizations, and Entities .....	124
Costs.....	125
Timeline .....	125
Existing Programs .....	125
Public Outreach Component .....	125
Objective .....	125

Activity 1 .....	126
Activity 2 .....	126
Activity 3 .....	126
Activity 4 .....	126
Primary Coordinating Agency .....	126
Participating Agencies, Organizations, and Entities .....	126
Costs.....	126
Timeline .....	127
Existing Programs .....	127
Public Outreach Component .....	129
Objective .....	129
Wetlands and Biodiversity Implementation Plan 3: Hydromodification / Hydromodification (7.4.1), (7.4.2), (7.5.3), and (7.6.1).....	129
Activity 1 .....	129
Activity 2 .....	129
Primary Coordinating Agency .....	129
Participating Agencies, Organizations, and Entities .....	129
Costs.....	130
Timeline .....	130
Existing Programs .....	130
Public Outreach Component .....	130
Objective .....	130
Shoreline Management and Near Shores Issues Implementation Plan 1: Insufficient Sand Supply ..	130
Activity 1 .....	130
Activity 2 .....	130
Primary Coordinating Agency .....	131
Participating Agencies, Organizations, and Entities .....	131
Costs.....	131
Timeline .....	131
Existing Programs .....	131
Public Outreach Component .....	131
Objective .....	131
Shoreline Management and Near Shore Issues Implementation Plan 2: Activities Landward of the Bluff Edge .....	132
Activity 1 .....	132
Activity 2 .....	132
Activity 3 .....	132
Activity 4 .....	132
Primary Coordinating Agency .....	132
Participating Agencies, Organizations, and Entities .....	133
Costs.....	133
Timeline .....	133
Existing Programs .....	133
Public Outreach Component .....	134
Objective .....	134
Land Use and Economic Development Implementation Plan 1: Provide for Coordinated Land Use Planning / Urban (5.3.3), (5.6.1), (5.6.2), (5.8.1), (5.8.2), Hydromodification (7.4.1), (7.4.2), (7.5.3), (7.6.1).....	134
Activity 1 .....	134
Activity 2 .....	134
Activity 3 .....	134
Activity 4 .....	134

Activity 5 .....	134
Activity 6 .....	134
Activity 7 .....	135
Activity 8 .....	135
Primary Coordinating Agency .....	135
Participating Agencies, Organizations, and Entities .....	136
Costs.....	136
Timeline .....	136
Existing Programs .....	136
Home Sewage Treatment Systems (HSTS) .....	136
Stormwater Management and NPDES Phase II.....	140
Erosion and Sediment Control.....	151
Riparian and Wetland Setbacks .....	153
Public Outreach Component .....	154
Objective .....	154
Recreation and Public Access Implementation Plan 1: Strategic Recreation Plan / Urban (5.3.2) ....	155
Activity 1 .....	155
Primary Coordinating Agency .....	155
Participating Agencies, Organizations, and Entities .....	155
Costs.....	155
Timeline .....	155
Existing Programs .....	155
Public Outreach Component .....	155
Objective .....	156
Evaluation and Performance Measures.....	157
Water Quality Implementation Plan 1: Salt Contamination / Urban (5.3.2) .....	157
Wetlands and Biodiversity Implementation Plan 1: Wetlands Mitigation / Urban (5.3.2).....	157
Wetlands and Biodiversity Implementation Plan 2: Flora Biodiversity Loss / Urban (5.3.2).....	157
Wetlands and Biodiversity Implementation Plan 3: Hydromodification / Hydromodification (7.4.1), (7.4.2), (7.5.3), (7.6.1).....	158
Shoreline Management and Near Shore Issues Implementation Plan 1: Insufficient Sand Supply ...	158
Shoreline Management and Near Shore Issues Implementation Plan 2: Activities Landward of the Bluff Edge .....	158
Land Use and Economic Development Implementation Plan 1: Provide for Coordinated Land Use Planning / Urban (5.3.3), (5.6.1), (5.6.2), (5.8.1), (5.8.2), Hydromodification (7.4.1), (7.4.2), (7.5.3), (7.6.1) .....	158
Recreation and Public Access Implementation Plan 1: Strategic Recreation Plan / Urban (5.3.2) ....	159
Plan Update and Revision .....	160

# **List of Tables**

<b>Table 1. Demographics</b>	<b>6</b>
<b>Table 2. CtA Limitations</b>	<b>20</b>
<b>Table 3. TyB Limitations</b>	<b>21</b>
<b>Table 4. Pa Limitations</b>	<b>21</b>
<b>Table 5. CtB Limitations</b>	<b>22</b>
<b>Table 6. RhA Limitations</b>	<b>22</b>
<b>Table 7. Cg Limitations</b>	<b>23</b>
<b>Table 8. OtB Limitations</b>	<b>23</b>
<b>Table 9. PsB Limitations</b>	<b>24</b>
<b>Table 10. Or Limitations</b>	<b>24</b>
<b>Table 11. CyB Limitations</b>	<b>25</b>
<b>Table 12. TzA Limitations</b>	<b>26</b>
<b>Table 13. Sw Limitations</b>	<b>26</b>
<b>Table 14. Kf Limitations</b>	<b>27</b>
<b>Table 15. Elf Limitations</b>	<b>27</b>
<b>Table 16. TyC Limitations</b>	<b>28</b>
<b>Table 17. St Limitations</b>	<b>28</b>
<b>Table 18. EnB Limitations</b>	<b>29</b>
<b>Table 19. Gr Limitations</b>	<b>29</b>
<b>Table 20. PsA Limitations</b>	<b>30</b>
<b>Table 21. CxA Limitations</b>	<b>30</b>
<b>Table 22. ElC Limitations</b>	<b>31</b>
<b>Table 23. Ad Limitations</b>	<b>32</b>
<b>Table 24. PeC2 Limitations</b>	<b>32</b>
<b>Table 25. Land Use / Land Cover</b>	<b>57</b>
<b>Table 26. Impervious Cover</b>	<b>60</b>
<b>Table 27. HSTS Summary</b>	<b>130</b>
<b>Table 28. Lake County Household Sewage Treatment System Summary in Mentor Marsh Watershed</b>	<b>131</b>
<b>Table 29. Lake County Semi-Public Treatment System Summary</b>	<b>133</b>

# List of Figures

<b>Figure 1. Mentor Marsh Watershed</b>	<b>2</b>
<b>Figure 2. Census Tracts</b>	<b>4</b>
<b>Figure 3. Population Density</b>	<b>5</b>
<b>Figure 4. Contours</b>	<b>18</b>
<b>Figure 5. Drift Thickness</b>	<b>19</b>
<b>Figure 6. Glacial Geology</b>	<b>19</b>
<b>Figure 7. Soils</b>	<b>34</b>
<b>Figure 8. Drainage Characteristics</b>	<b>35</b>
<b>Figure 9. Steep Slopes</b>	<b>36</b>
<b>Figure 10. Water Table</b>	<b>37</b>
<b>Figure 11. Streams</b>	<b>42</b>
<b>Figure 12. Watersheds</b>	<b>43</b>
<b>Figure 13. 100-Year Floodplains</b>	<b>44</b>
<b>Figure 14. HHEIs</b>	<b>45</b>
<b>Figure 15. EPA 2006 WQ Report Appendix D</b>	<b>46</b>
<b>Figure 16. EPA 2006 WQ Report Appendix E</b>	<b>47</b>
<b>Figure 17. EPA 2006 WQ Report Aquatic Life Use Status</b>	<b>48</b>
<b>Figure 18. EPA 2006 WQ Report Section 303(d)</b>	<b>49</b>
<b>Figure 19. 1987 Ohio Wetlands Inventory</b>	<b>50</b>
<b>Figure 20. Ohio GAP Analysis Wetlands</b>	<b>51</b>
<b>Figure 21. OEPA Analysis Wetlands</b>	<b>52</b>
<b>Figure 22. Lakes and Ponds</b>	<b>53</b>
<b>Figure 23. DRASTIC</b>	<b>56</b>
<b>Figure 24. Land Use</b>	<b>58</b>
<b>Figure 25. Generalized Land Use</b>	<b>59</b>
<b>Figure 26. Development Comparison</b>	<b>61</b>
<b>Figure 27. Impervious Cover</b>	<b>62</b>
<b>Figure 28. Waste Water Treatment Plant</b>	<b>63</b>
<b>Figure 29. Parks and Protected Property</b>	<b>67</b>
<b>Figure 30. Oil/Gas and Brine Wells</b>	<b>90</b>
<b>Figure 31. Salt Fill Location</b>	<b>91</b>



## **List of Graphs**

<b>Graph 1. Creek Identity</b>	<b>12</b>
<b>Graph 2. Rating the Watershed</b>	<b>13</b>
<b>Graph 3. Landowner Interests</b>	<b>13</b>
<b>Graph 4. Harming Creeks</b>	<b>14</b>
<b>Graph 5. Protecting Creeks</b>	<b>14</b>
<b>Graph 6. General Opinions</b>	<b>15</b>
<b>Graph 7. Watershed Opinions</b>	<b>16</b>

## **Appendices (on enclosed CD)**

**Davey Resources Mentor Marsh Area Special Areas Management Plan CD**  
**-includes SAMP, Issues Characterization, as well as most other**  
**documents created during the SAMP process by the MARC and/or**  
**Davey Resources.**

# **Acknowledgments**

The members of the Marsh Area Regional Coalition should be most acknowledged for their development of the Issues Characterization and Special Areas Management Plan. Their vision for the watershed and its natural resources is truly special.

Other partners who assisted in the creation of this document:

Matt Scharver, Lake SWCD  
Dan Donaldson, Lake SWCD  
Pam Brown, Lake SWCD  
Jim Bissell, Cleveland Museum of Natural History  
Keith Moran, Cleveland Museum of Natural History  
Kurt Kraus, City of Mentor  
Brad Shawhan, City of Mentor  
Darrell Webster, Lake County Planning Commission  
Frank Lichtkoppler, OSU Extension  
Chris Loxterman, Lake County General Health District  
Tracy Salkiewicz, Lake County Stormwater Management District  
Ingrid Panic, Lake County Stormwater Management District  
Al Saari, Lake County Department of Utilities  
Charlotte McCurdy, ODNR-DNAP  
Dave Frank, ODNR-Parks  
Stacey Fineran, Ohio State University  
Matt Adkins, ODNR-Division of Soil and Water  
Dorothy Farris, ODNR-Division of Soil and Water  
Mark Bergman, OEPA  
Paul Anderson, OEPA  
Ana Burns, Davey Resources  
Dana Oleskiewicz, OSU, Wooster  
Aaron Lantz, ODNR – DSWC, Columbus  
Chris Kasselman, ODNR-DSWC, Columbus

## **Distribution List**

Hard copies of the Mentor Marsh Watershed Action Plan, upon endorsement, will be distributed to City Administrators (or appropriate representative), MARC officers, the Morley Public Library, Lake County OSU Extension, Lake County Soil and Water Conservation District, Cleveland Museum of Natural History, Lake County Planning Commission and the Mentor Marsh Advisory Board. Other persons interested in obtaining a copy of the plan are encouraged to download it from the MARC website.

<http://www.lakecountyohio.org/planning/marc/>

# **Endorsement**

Upon endorsement by Ohio Environmental Protection Agency and Ohio Department of Natural Resources, representatives from communities in the watershed, MARC officers and selected stakeholders will be asked to sign and approve the final plan and agree to pursue implementation of this Watershed Action Plan.

Village of Mentor on the Lake

City of Mentor

City of Painesville

Village of Fairport Harbor

Painesville Township

Concord Township

Lake County Planning Commission

Ohio State University Extension

Lake County Soil and Water Conservation District

Cleveland Museum of Natural History

Mentor Marsh Advisory Board

MARC, Chair

MARC, Vice Chair

MARC, Secretary

# **Calendar of Events**

## **2006 Coastweeks**

Ecotour of the Lagoons	Sept. 7	Brad Shawhan
Stargazing at Mentor Lagoons	Sept. 9	Bill Heinrich
A Botanical Walk in the Woods	Sept. 10	Keith Moran
Coastweeks Beach Clean Up	Sept. 16	Bonnie Rice
Coastal Dunes of Lake County	Sept. 16	Charlotte McCurdy
Bird Walk at Headlands	Sept. 17	Jim McConner
Who was Here First?	Sept. 17	Brian Redmond

## **2007 Coastweeks**

Family Paddle Trip	Sept. 8	No Instructor
Stargazing at Mentor Lagoons	Sept. 8	No Instructor
Coastweeks Beach Clean Up	Sept. 15	Bonnie Rice
Bird Walk at Mentor Lagoons	Sept. 16	Jim McConner
Harnessing the Power of Wind:	Sept. 19	Tim Denbow

2008 Coastweeks

***PENDING***

## **MARC MEETING DATES (future meeting dates will be announced on the MARC website)**

September 21, 2004

January 18, 2005

February 15, 2005

March 15, 2005

April 20, 2005

May 18, 2005

June 15, 2005

July 13, 2005

September 21, 2005

November 16, 2005

January 18, 2006

February 15, 2006

March 15, 2006

April 19, 2006

May 18, 2006

July 20, 2006

September 20, 2006

November 15, 2006

January 17, 2007

March 21, 2007

April 18, 2007

June 20, 2007

September 26, 2007

October 17, 2007

November 28, 2007

December 19, 2007

## **Educational Programs**

Rice Elementary Soils Program	March 8 <sup>th</sup> and 24 <sup>th</sup> , 2004 October 12 <sup>th</sup> , 2004
Hooked on Fishing	June 28 <sup>th</sup> , 2004 July 9 <sup>th</sup> and 16 <sup>th</sup> , 2004 June 8 <sup>th</sup> , 2005
Wonders of Watersheds	June, 2004 August, 2005
Lake Elementary Enviroscope	November 8 <sup>th</sup> , 2004
Orchard Hollow Elementary Web Of Life	March 23 <sup>rd</sup> , 2005
Orchard Hollow Elementary Fred The Fish	April 6 <sup>th</sup> , 2005
Garfield Elementary Soils Program	April 20 <sup>th</sup> , 2005
Rain Garden Workshop	April 27 <sup>th</sup> , 2006 September 12 <sup>th</sup> , 2007 September 19 <sup>th</sup> , 2007
Memorial Junior High Quest Program	October 31 <sup>st</sup> , 2006 November 1 <sup>st</sup> , 2006
Mentor Marsh Nature Center Project Wet	June 26 <sup>th</sup> , 2007

## List of Acronyms

305(b)	Ohio Environmental Protection Agency Water Quality Report
319	Section 319 of the Clean Water Act
BGI	Balanced Growth Initiative
BMP	Best Management Practices
CFS	Cubic Feet per Second
CPP	Continuing planning process
CWH	Coldwater Habitat
ERU	Equivalent residential unit
EWH	Exceptional Warm Water Habitat
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GLC	Great Lakes Commission
GPM	Gallons Per Minute
HB	House Bill
HHEI	Headwater Habitat Evaluation Index
HSTS	Household Sewage Treatment Systems
HUC #	Hydrologic Unit Code Number
IBI	Index of Biotic Integrity
ICI	Invertebrate Community Index
LCGHD	Lake County General Health District
LCSMD	Lake County Stormwater Management Department
LEPF	Lake Erie Protection Fund
LPA	Land Protection Agencies
MiWB	Modified Index of Well Being
MRCC	Midwestern Regional Climate Center
MS4	Municipal Separate Storm Sewer Systems
NASA	National Aeronautics and Space Administration
NEFCO	Northeast Ohio Four County Regional Planning and Development Organization
NOACA	Northeast Ohio Areawide Coordinating Agency
NPDES	National Pollution Discharge Elimination System
NPS	Non Point Source Pollution
NRCS	Natural Resource Conservation Service
OCAP	Ohio Capability Analysis Project
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OLEC	Ohio Lake Erie Commission
POS	Point of Sale
QHEI	Qualitative Habitat Evaluation Index
RM	River Mile
SPSDS	Semi-Public Sewage Disposal Systems
SSH	Seasonal Salmonid Habitat
SWCD	Soil & Water Conservation District
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
USGS	United States Geological Society
WMSC	Water Management and Sediment Control
WPCLF	Water Pollution Control Loan Fund
WQM	Water Quality Management
WWH	Warmwater Habitat



WWTP

Wastewater Treat