Appendix A: Annotated Bibliography of Techniques

This document is a living bibliography of potential techniques that were gathered after the December 9, 2009 document entitled *Lake Algal Control Techniques with Implications for Vancouver Lake*. The purpose of this bibliography is to serve as a location to keep track of techniques that would be analyzed for appropriateness for Vancouver Lake at a future date. This will be updated from time to time as new references come to the attention of Partnership members.

The bibliography is organized first by techniques that were included in the 2009 report, providing additional references for those techniques that were considered. After the techniques that were considered in 2009, additional techniques are listed along with references for those techniques.

Techniques Explored in the 2009 Document:

1. Best Management Practices
2. Water Level Drawdown
3. Lake Sediment Removal
4. Recruit/Plant Rooted Plants
5. Modify Lake Footprint
6. Dilution and Flushing
7. Biomanipulation
8. Phosphorus Inactivation
9. Algaecides
10. Algaestats
11. Artificial Circulation
12. Mechanical Removal
13. Shading

New Techniques included here:

14. Water Level Management
15. Floating Wetlands

Additional References for existing techniques:

Best Management Practices

1. Rip, Winnie J., et al. 2005. "Oscillation of a shallow lake ecosystem upon reduction in external phosphorus load0". *Archiv für Hydrobiologie***.** 164 (3): 387-409. http://www.citeulike.org/user/hugoc/article/416929

2. Chen, Y., et al. 2003. "Changes of nutrients and phytoplankton chlorophyll-*a* in a large shallow lake, Taihu, China: an 8-year investigation." *Hydrobiologia*. 506-509

(1-3): 273-279. http://www.jlakes.org/web/eutrophication-restoration-shallowlakes-revisited-H2003.pdf

Water Level Drawdown

1. Van Wichelen, J., et al. 2007. "The importance of drawdown and sediment removal for the restoration of the eutrophied shallow Lake Kraenepoel (Belgium)." *Hydrobiologia*. 584 (1): 291-303. http://rd.springer.com/article/10.1007/s10750-007-0611-z

2. Coops, H., et al. 2003. "The role of water-level fluctuations in shallow lake ecosystems workshop conclusions."*Hydrobiologia*. 506-509: 23. http://connection.ebscohost.com/c/articles/14973912/role-water-level-fluctuations-shallow-lake-ecosystems-workshop-conclusions

Recruit/Plant Rooted Plants

Aquatic Macrophytes:

1. Van Donk, E. & van de Bund, W.J. 2002. "Impact of Submerged Macrophytes Including Charophytes on Phyto- and Zooplankton Communities: Allelopathy Versus Other Mechanisms." *Aquatic Botany*. 72(3-4): 261-274. http://linkinghub.elsevier.com/retrieve/pii/S0304377001002054

2. Coops, H. & R. W. Doef. 1996. "Roel W. "Submerged Vegetation Development in Two Shallow, Eutrophic Lakes". *Hydrobiologia.* 340(1-3): 115-120. http://www.springerlink.com/index/V46KV4P374213532.pdf

3. Ozimek, T., et al. 1990. "Can Macrophytes Be Useful in Biomanipulation of Lakes? The Lake Zwemlust example". *Hydrobiologia.* 200-201(1): 399-407. http://www.springerlink.com/index/81875162H6665421.pdf

4. Qiu, D., et al. 2001. "The restoration of aquatic macrophytes for improving water quality in a hypertrophic shallow lake in Hubei Province, China." *Ecological Engineering*. 18 (2): 147–156. http://www.sciencedirect.com/science/article/pii/S092585740100074X

5. Van Donk, E. & Van de Bund, W.J. 2001. "Impact of submerged macrophytes including charophytes on phyto- and zooplankton communities: allelopathy versus other mechanisms." *Aquatic Botany*. 72 (3–4): 261–274. http://www.sciencedirect.com/science/article/pii/S0304377001002054

6. Irfanullah, H., Moss, B. 2004. "Factors influencing the return of submerged plants to a clear-water, shallow temperate lake." *Aquatic Botany*. 80 (3):177–191. http://www.sciencedirect.com/science/article/pii/S0304377004001342

Creating refuges for grazers:

1. Moss, B., et al. 1991. "Development of Daphnid Communities in Diatom- and Cyanophyte-Dominated Lakes and Their Relevance to Lake Restoration by Biomanipulation." *Journal of Applied Ecology*. 28(2): 586-602. http://www.jstor.org/stable/2404570

2. Jeppesen, E., et.al. 2007. Shallow Lake Restoration by Nutrient Loading Reduction—Some Recent Findings and Challenges Ahead". *Hydrobiologia*. 196(5): 239-252. http://www.springerlink.com/index/g176v2123187mh12.pdf

Wetland- specific:

1. Lowe, E. F., et.al. 1992. "Particulate Phosphorus Removal Via Wetland Filtration: An Examination of Potential for Hypertrophic Lake Restoration." *Environmental Management*. 16(1): 67-74. http://www.springerlink.com/index/P0304214V65V104U.pdf

Integrated Ecological Floating Bed:

1. Li, X., et. al. 2010. "An integrated ecological floating-bed employing plant, freshwater clam and biofilm carrier for purification of eutrophic water**."** *Ecological Engineering*. 36 (4): 382–390. http://www.sciencedirect.com/science/article/pii/S092585740900281X

Biomanipulation

Biomanipulation in general:

1. Jeppesen, E., et.al. 1990. "Fish Manipulation as a Lake Restoration Tool in Shallow, Eutrophic, Temperate Lakes 2: Threshold Levels, Long-term Stability and Conclusions". *Hydrobiologia*. 200-201(1). 219-227. http://www.springerlink.com/index/43150R7643712571.pdf

2. Søndergaard, M., et.al. 2007. "Lake Restoration: Successes, Failures and Long-term Effects". *Journal of Applied Ecology*. 44(6): 1095–1105. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2007.01363.x/full

3. Kwang-Guk An, et.al. 2010. "Control of Algal Scum Using Top-Down Biomanipulation Approaches and Ecosystem Health Assessments for Efficient Reservoir Management." *Water, Air, & Soil Pollution*. 205 (1-4): 3-24. http://www.springerlink.com/content/r44h85n51326v474/

Biomanipulation along with sediment removal:

1. Moss, B., et.al. 1996. "Progressive Restoration of a Shallow Lake: A 12-Year Experiment in Isolation, Sediment Removal and Biomanipulation". *Journal of Applied Ecology*. 33(1): 71-86. http://www.jstor.org/pss/2405017

Biomanipulation coupled with phosphorus reduction:

1. Jeppesen, E., et al. 2007. "Restoration of Shallow Lakes By Nutrient Control and Biomanipulation: The Successful Strategy Varies With Lake Size and Climate". *Hydrobiologia.* 581 (1): 269-285.

2. Jeppesen, E., et al. 2007. "Shallow lake restoration by nutrient loading reduction—some recent findings and challenges ahead." *Hydrobiologia.* 584 (1): 239-252. http://www.springerlink.com/content/g176v2123187mh12/

Effects of biomanipulation of fish on the food web:

1. Williams, A.E., and B. Moss. 2003. "Effects of Different Fish Species and Biomass on Plankton Interactions in a Shallow Lake". *Hydrobiologia*. 491(1-3): 331-346. http://www.springerlink.com/index/T46781Q002254072.pdf

2. Meijer, M.L., et.al. 1994. "Long-term Responses to Fish-stock Reduction in Small Shallow Lakes: Interpretation of Five-year Results of Four Biomanipulation Cases in the Netherlands and Denmark". *Hydrobiologia*. 275-276(1): 457-466. http://www.springerlink.com/index/M7208H03511064G5.pdf

3. Miller, S. A. and T.A. Crowl. 2006. "Effects of Common Carp (*Cyprinus Carpio*) on Macrophytes and Invertebrate Communities in a Shallow Lake". *Freshwater Biology*. 51: 85–94. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2427.2005.01477.x/full

Effects on the food web and sediment phosphorus release:

1. Phillips, G., et.al. 1994. "The Importance of Sediment Phosphorus Release in the Restoration of Very Shallow Lakes (The Norfolk Broads, England) and Implications for Biomanipulation." *Hydrobiologia*. 275-276(1): 445-456. http://www.springerlink.com/index/P73H64K5100264U7.pdf

Biomanipulation through recruitment/planting of filter feeding invertebrates:

1. Bain, M., et.al. 2006. "Setting Targets for Restoration of the Hudson-Raritan Estuary. Report of an Interdisciplinary Workshop." Hudson River Foundation. New York, New York. http://www.hudsonriver.org/download/HRE_Targets_Wrkshp_Oct05.pdf

2. US Environmental Protection Agency. 2010. *Appendix U: Accounting for the Benefits of Filter Feeder Restoration Technical Documentation. Strategies for Allocating Filter Feeder Nutrient Assimilation into the Chesapeake Bay TMDL.* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/AppendixUFilterFeeders_final.pdf

3. Fulford, R., et al. 2010. "Evaluating ecosystem response to oyster restoration and nutrient load reduction with a multispecies bioenergetics model." *Ecological Applications.* 20:915–934. http://www.esajournals.org/doi/abs/10.1890/08-1796.1.

4. Chen, Y., et al. 2010. "Research Progress of Benthic Mollusks for Water Environmental Ecological Restoration." *Water Purification Technology*. http://en.cnki.com.cn/Article_en/CJFDTOTAL-ZSJS201001004.htm

Phosphorus Inactivation

Different approaches to address high phosphorus:

1. Kleeberg, A. & H-P. Kozerski. 1997. "Phosphorus Release in Lake Groβer Müggelsee and Its Implications for Lake Restoration." *Hydrobiologia.* 342-343(0): 9-26. http://www.springerlink.com/index/rk17gxm6h6v27225.pdf

2. Egemose, S., et al. 2010. "Chemical Lake Restoration Products: Sediment Stability and Phosphorus Dynamics." *Environ. Sci. Technol.*, 44 (3): 985–991.

3. Wang, H. and Wang, H. 2009. "Mitigation of lake eutrophication: Loosen nitrogen control and focus on phosphorus abatement." *Progress in Natural Science.* 19: 1445-1451.

4. Weinberg, E., et al. 2011. "Examining Nanotechnology for Recovery of Phosphorus." *WaterWorld*. 11 (4). http://www.waterworld.com/articles/iww/print/volume-11/issue-4/feature-editorial/examining-nanotechnology-for-recovery-of-phosphorus.html

Using Alum:

1. Reitzel, K., et al. 2005. "Lake Restoration by Dosing Aluminum Relative to Mobile Phosphorus in the Sediment." *Environmental Science & Technology*. 39(11): 4134-4140. http://pubs.acs.org/doi/abs/10.1021/es0485964.

2. Mehner, T., et al. 2008. "Rapid Recovery from Eutrophication of a stratified Lake by disruption of internal nutrient load." *Ecosystems*. 11: 1142-1156. http://ukpmc.ac.uk/abstract/AGR/IND44121776/reload=0;jsessionid=1M1tk96wd4feNdfzKnDO.0

Iron phosphorus ratio:

1. Jensen, H.S., et al. "Iron: Phosphorus Ratio in Surface Sediment as an Indicator of Phosphate Release from Aerobic Sediments in Shallow Lakes". *Hydrobiologia.* 235-236(1): 731-743. http://www.springerlink.com/index/t56v1158q0257278.pdf

Differing responses of blue green algae to Phosphorus reductions:

1. Padisák, J. & V. Istvánovics. 1997. "Differential Response of Blue-green Algal Groups to Phosphorus Load Reduction in a Large Shallow Lake: Balaton, Hungary". *Verh. Internat. Verin. Limnol.* 26: 574-580. http://www.mtakpa.hu/kpa/download/1014156.pdf

Alum treatment and water level draw down:

1. North American Lake Management Society, Environmental Protection Agency, and Office of Water Regulations and Standards. *Lake Restoration, Protection, and Management: Proceedings of the Second Annual Conference, North American Lake*

Management Society, October 26-29, 1982, Vancouver, British Columbia. Vol. 83. Is. 1. Washington, D.C.: U.S. Environmental Protection Agency, Office of Water Regulations and Standards. 1982. http://books.google.com/books?hl=en&lr=&id=lH1ItHvDk64C&oi=fnd&pg=PA112&dq=Shallow+lake+restoration&ots=_ACfxVWtQd&sig=Y1iIWdXduKYNMI-ZNGHgGE_AGf0

Algaestats

1. Murray, D. 2009. "The potential of barley straw as an algal and cyanobacterial growth control." PhD. Cranfield University Centre for Water Sciences. https://dspace.lib.cranfield.ac.uk/handle/1826/4459

New Techniques:

Water Level Management

1. Coops, H., et al. 2003. "The Role of Water-level Fluctuations in Shallow Lake Ecosystems – Workshop Conclusions. *Hydrobiologia*. 506-509(1-3): 23-27. http://www.springerlink.com/index/J362T21718T0R663.pdf

Floating Wetlands

Floating wetland, in conjunction with Alum:

1. DeBusk, T. A., et al. 2005. "Evaluation of a Floating Wetland for Improving Water Quality in an Urban Lake." *Proceedings of the 8th Biennial Conference (2005) on Stormwater Research and Watershed Management*. pp. 175-184. Southwest Florida Water Management District, Brooksville, FL. http://asae.frymulti.com/abstract.asp?aid=17809&t=1

General Information

General findings comparing lake studies, funding:

1. Jeppesen, E., et al. 2005. "Lake Responses to Reduced Nutrient Loading – An Analysis of Contemporary Long-term data From 35 Case Studies". *Freshwater Biology*. 50(10): 1747-1771. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2427.2005.01415.x/full

2. Gulati, D., et al. 2008. "Lake restoration studies: Failures, bottlenecks and prospects of new ecotechnological measures." Limnologica - Ecology and Management of Inland Waters. Volume 38, Issues 3–4, Pages 233–247. http://www.sciencedirect.com/science/article/pii/S0075951108000327

Modeling tool:

1. Janse, J. H. & van Liere, L. 2000. "PC Lake: A Modeling Tool for the Evaluation of Lake Restoration Scenarios." *Water Science and Technology*. 31(8): 371-374. http://linkinghub.elsevier.com/retrieve/pii/027312239500392Z

Mechanisms of cyanobacterial dominance:

1. Dokulil, M.T. and Teubner, K. 2000. "Cyanobacterial dominance in lakes." *Hydrobiologia.* 438 (1-3): 1-12.

Phosphorus Release Chemistry:

1. Lehman, John T. 2011. "Nuisance cyanobacteria in an urbanized impoundment: interacting internal phosphorus loading, nitrogen metabolism, and polymixis." *Hydrobiologia*. 661:277-287. www.umich.edu/~hrstudy/Reports/Hydrobiol2011.pdf

Methods of sediment contaminant Management that may be useful for nutrients:

1. Perelo, L.W. 2010. "Review: In situ and bioremediation of organic pollutants in aquatic sediments." *Journal of Hazardous Materials*. 177: 81-89.