LIZHU WANG

Curriculum Vitae

Address: International Joint Commission, Great Lakes Office, 100 Ouellette Avenue, Windsor, ON N9A 6T3.
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Education:

Ph.D. in Aquatic Ecology, with minor in statistics, Montana State University, 1992.
M.S. in Fisheries, Montana State University, 1988.
B.S. in Aquaculture, Dalian Fisheries University, 1982.

Research Interest:

Evaluating influences of natural and anthropogenic environmental factors on water quality, physical habitat, and biological communities; modeling relationships among hydrology, thermal, landscape, land-use, physical habitat, and biota; developing tools and conducting aquatic system classification for management evaluation and environmental impairment assessment; and assessing potential impacts of climate and land-use changes on aquatic ecosystems.

Professional Appointments:

Environmental Science Advisor – International Joint Commission, Great Lakes Regional Office, November 2011 to present.
Director - Institute for Fisheries Research, Michigan Department of Natural Resources and University of Michigan, August 2003 to 2011.
Research Watershed Ecologist - Advanced, Bureau of Integrated Science Services, Wisconsin Department of Natural Resources, April 1994 to July 2003.
Fisheries Specialist, Fish and Wildlife Division, Minnesota Department of Natural Resources, August 1992 - April 1994,
Research Assistant, Department of Biology, Montana State University, Bozeman, August 1986 - August 1992,
Lecturer/Research Associate, Department of Aquaculture, Dalian Fisheries University, Dalian, China, January 1982 - August 1986.

Professional Services:

Adjunct Associate Professor – School of Natural Resources and Environment, University of Michigan, 2003 to present
Adjunct Associate Professor – Department of Fisheries and Wildlife, Michigan State University, 2006 to present.
Adjunct Assistant Professor – Department of Fisheries and Wildlife, University of Wisconsin-Stevens Point, 1998-2003.

Editorial Board – Environmental Management, December 2005 to present.
Editorial Board - ISRN (International Scholarly Research Network) Ecology, 2010-present.
Co-editor – Michigan Department of Natural Resources Research Report and Technical Report, 2006-2007 and 2009-2011.
Associate Editor – North American Journal of Fisheries Management, September 2004-2007.

National Coastal Land-Use Database Development Core Team, 2011.
National Aquatic Habitat Condition Assessment Team, 2005-present.
Great Lakes Fish Habitat Partnership Data and Science Committee, 2009-present.
Midwest Fish Habitat Partnership Science Network Science Advisor, 2008-present.
Midwest Glacial Lake Fish Habitat Partnership Data and Science Committee, 2007-present.
Michigan Department of Natural Resources Climate Change Team, 2008-2011.

Michigan Department of Natural Resources Lake Michigan Management Team, 2007-2010.
US Environmental Protection Agency Aquatic Biological Gradient Condition Assessment Team, 2002-2004.
Wisconsin Department of Natural Resources Aquatic Thermal Criteria Task Group, 2000-2002.
Wisconsin Department of Natural Resources Agriculture Best Management Assessment Team, 1994-2003.

Grant Review Panels: Austrian Science Fund, National Science Foundation, US Environmental Protection Agency STAR program, US National Oceanic and Atmospheric Administration Coastal Program, US National Science Foundation, Sea Grant, Great Lakes Program

Review for Journals: Canadian Journal of Fisheries and Aquatic Resources, Conservation Ecology, Ecology, Ecological Applications, Ecological Modeling, Ecological Letters, Environmental Management, Environmental Monitoring and Assessment, Environmental Science & Technology, Freshwater Biology, Hydrobiologia, Hydrological Research Letters, Journal of American Water Resources Association, Landscape Ecology, North American Journal of Fisheries Management, Restoration Ecology, River Research and Applications, Science of the Total Environment, Transactions of the American Fisheries Society

Graduate Student Committees and Post Doctorial Fellows:

Master Students: Arthur Cooper, Michigan State University; Zachary Hecht-Leavitt, University of Michigan; Bread Love, Michigan State University; Mathew Einheuser. Michigan State University; Ralph Tingley, Michigan State University; Greschin Swisher, University of Michigan; Kristine Stepenuck, University of Wisconsin-Stevens Point; Kyle Zimmer, St. Cloud State University.

Ph.D. Students: Darren Thornbrugh, MichiganState University; Peter Esselman, University of Michigan.

Post Doctorial Fellows: Travis Brenden, Dana Infante, Dayong Wu, Peter Esselman, Damon Kruegor, Yin-Phan Tsang.

Research Grants and Contracts:

Landscape Conservation Cooperatives:
"A Regional Decision Support Tool for Identifying Vulnerabilities of Riverine Habitat and Fishes to Climate Change". $400,000. Co-PI with Jana Stewart and 3 others, 2011-2013.

Great Lakes Fisheries Trust:
"Development of Great Lakes Aquatic Habitat Database and Classification Framework". $520,000. Co-PI with Catherine Riseng and 5 others, 2011-2015.

Michigan Department of Environmental Quality:
"Enhancing a GIS-Based Decision Support Tool for Evaluating Windfarm Sitings in Michigan's Coastal Waters". $150,000. Co-PI with Edward Rutherford, 2011-2014.

U.S. Geological Survey:
"Managing the Nations Fish Habitat at Multiple Spatial Scales in a Rapidly Changing Climate". $2,618,000. Co-PI with Craig Paukert and 11 others, 2009-2013.

Michigan Department of Natural Resources - Sport Fish Restoration Program:
"Development of Management Scenarios for Lake and Stream Habitat and Fisheries under Current and Future Land-Use and Climate Conditions". Co-PI with Kevin Wehrly and Jim Breck, 2010-2015.

Michigan Department of Natural Resources - Sport Fish Restoration Program:
"Development of databases, classification systems, and fisheries management tools for inland lakes of Michigan". Co-PI with Kevin Wehrly and Jim Breck, 2008-2012.

US Department of Energy:
"Development of a GIS-Based Decision Support Tool for Evaluating Windfarm Sitings in Great Lakes Aquatic Habitats". $120,000. Co-PI with Edward Rutherford, 2010-2012.

US Wildlife Action Plan Program:
"Refinement of the Aquatic Portion of Michigan's Wildlife Action Plan and Development of Tools to Support the Plan". Co-PI with Liz Hay, 2009-2014.

National Fish Habitat Action Plan Program:
"Assessment of National Fish Habitat Status for Lakes and Reservoirs". $330,000. Co-PI with Dana Infante and Bill Taylor, 2008-2012.

Michigan Department of Natural Resources - Sport Fish Restoration Program:
"Improve and validate river segment identification and classification models for assessing fishery potential and environmental impairment in Michigan". Co-PI with Paul Seelbach, 2004-2009.

US Fish and Wildlife Services:
"An Initial National Assessment of the Status of Fish Habitats". $85,000. Co-PI with Dana Infante and Bill Taylor, 2006-2008.

Great Lakes Trust:
"Evaluation and Synthesis of Methods for Identifying And Quantifying Critical Fisheries Habitat for Great Lakes Lower Riverine and Nearshore Zones". $106,000. Co-PI with Michael Wiley and 3 others, 2006-2007.

Great Lakes Protection Fund:
"Restoring Great Lakes Basin Water Through the Use of Conservation Credits and Integrated Water balance Analysis System". $450,000. Co-PI with Jon Bartholic and 3 others, 2005-2007.

US Environmental Protection Agency STAR Program:
"Ecological Classification of Rivers for Environmental Assessment: Demonstration, Validation, and Application to Regional Risk Assessment Across Illinois, Michigan, and Wisconsin". $748,500. Co-PI with Paul Seelbach and 7 others, 2003-2007.

US Geological Survey, Aquatic GAP Program:
"Development of Stream Segment Classification". $62,700. Co-PI with Jana Stewart, 2002-2004.

US Environmental Protection Agency, Environmental Monitoring and Assessment Program:
"Development of a Probability-Based Stream Monitoring and Assessment Strategy for Wisconsin". $240,000. Co-PI with Mike Miller (Wisconsin DNR) and Dale Robertson (U.S. Geological Survey), 2002-2004.

University of Wisconsin - Water Resources Institute:
"Impacts of Land Use and Groundwater Flow on the Temperature of Wisconsin Trout Streams". $66,400. Co-PI with Stephen Gaffield (University of Wisconsin, Madison), 2001-2003.

State of Wisconsin – Water Division:
"Impact of Phosphorus and Nitrogen Concentrations on the Biological Integrity of Wisconsin Streams". $400,000. Co-PI with Dale Robertson and Paul Garrison, 2001-2003.

State of Wisconsin - Sport Fish Restoration Program:
"Development of Land Use Decision Making Model". Co-PI with John Lyons, 2001-2004.

Wisconsin Department of Natural Resources, Bureau of Watershed Management:
"Evaluation of habitat and fish responses in streams during Priority Watershed Projects". $500,000. Co-PI

with John Lyons, 1994-2004.

US Environmental Protection Agency, Environmental Monitoring and Assessment Program:
"Spatial Evaluation of the Northern Lakes and Forest: Development of Watershed Indicators and Status of Wadeable Streams". $400,000. Co-PI with Tom Simon and 4 others, 1998-2001.

Wisconsin Department of Natural Resources, Bureau of Watershed Management:
"Modeling effects of urban land use on stream habitat, macroinvertebrates, and fish communities". $200,000. Co-PI with John Lyons, 1997-2002.

Peer Reviewed Publications:

1. **Wang, L**., T. Brenden, Y. Cao, P. Seelbach. In review. Delineation and validation of river network spatial units for water resources and fisheries management. Environmental Management.

2. Einheuser, M, P. Nejadhashemi, **L. Wang**, S. Sowa. In review. Relationships between in-stream conditions and ecological health under different land-use and climate scenarios using a watershed model. Science of the Total Environment.

3. Esselman, P.C., D.M. Infante, **L. Wang**, A.R. Cooper, D. Wieferich, Y. Tsang, D. Thornbrugh, and W.W. Taylor. In review. Regional fish community indicators of ecological condition for rivers of the conterminous United States. Ecological Indicators.

4. Esselman, P. C., M. Edgar, J. Breck, L. Hay-Chmielewski, and **L. Wang**. In review. Systematic planning of fish conservation focal areas for rivers of Michigan, USA. Aquatic Conservation: Marine and Freshwater Ecosystems.

5. **Wang, L**., T. Brenden, J. Lyons, and D. Infante. In review. Prediction of in-stream physical habitat for Michigan and Wisconsin wadeable streams from GIS-derived landscape data. River Research and Applications.

6. Wehrly, K. E., J. E. Breck, **L. Wang**, L. S. Kraft. In review. Assessing local and landscape patterns of residential shoreline development in Michigan Lakes. Lake and Reservoir Management.

7. Wehrly, K. E. J. E. Breck, **L. Wang**, and L. Szabo-Kraft. In press. Classifying fish assemblages in sampled and unsampled lakes: a multivariate regression tree approach. Transactions of American Fisheries Society.

8. Wang, B., D. Liu, S. Liu, Y. Zhang, and **L. Wang**. 2012. Impacts of watershed urbanization on stream physical-chemical habitat and macroinvertebrate communities in the tributaries of Qiangtang River, China. Hydrobiologia 680:39-51.

9. **Wang, L**., D. Infante, P. Esselman, A. Cooper, D. Wu, W. Taylor, D. Beard, G. Whelan, and A. Ostroff. 2011. A hierarchical spatial framework and database for the national river fish habitat condition assessment. Fisheries 36(9): 436-449.

10. Esselman, P. C., D.M. Infante, **L. Wang**, D. Wu, A. Cooper, W.W. Taylor. 2011. A preliminary assessment of cumulative catchment disturbance levels for river fish habitats of the conterminous United States. Ecological Restoration 29:133-151

11. **Wang, L**., D. Infante, J. Lyons, J. Stewart, and A. Cooper. 2011. Effects of dams in river networks on fish assemblages in non-impoundment sections of rivers in Michigan and Wisconsin, USA. River

Research and Applications 27:473–487.

12. **Wang, L**., K. Wehrly, J. Breck, L.S. Kraft. 2010. Landscape based assessment of human disturbance for Michigan lakes. Environmental Management 46:471-483.

13. Wehrly, K.E, **L. Wang**, D. Infante, A. Cooper, C. Geddes, L. Stanfield, E. Rutherford. 2010. Landscape Change and its Influences on Aquatic Habitat and Fisheries in the Great Lakes Basin. *In*: W. Taylor, N. Leonard, and A. Lynch, editors. Great Lakes Fisheries Policy and Management: A Binational Perspective, 2nd Edition. Michigan State University Press, East Lansing.

14. Lyons, J., T. Zorn, J. Stewart, P. Seelbach, K. Wehrly, **L. Wang**. 2009. Defining and characterizing coolwater streams and their fish assemblages in Michigan and Wisconsin, USA. North American Journal of Fisheries Management 29:1130–1151.

15. Wehrly, K.E., T. O. Brenden, and **L. Wang**. 2009. A comparison of statistical approaches for predicting stream temperatures across heterogeneous landscapes. Journal of the American Water Resources Association 45:986-997.

16. Brenden, T., L. **Wang**, and Z. Sue. 2008. Quantitative identification of disturbance thresholds in support of aquatic resource management. Environmental Management 42:821-832.

17. Brenden, T., L. **Wang**, and P.W. Seelbach. 2008. A river valley segment classification of Michigan streams based on fish and physical attributes. Transactions of American Fisheries Society 137:1621-1636.

18. Stepenuck, K.F., R.L. Crunkilton, M.A. Bozek, **L. Wang**. 2008. Comparison of macroinvertebrate-derived water quality metrics between snags and riffles. Journal of the American Water Resources Association 44: 670-678.

19. **Wang, L.,** T. Brenden, P.W. Seelbach, A. Cooper, D. Allan, R. Clark, Jr., and M. Wiley. 2008. Landscape based identification of human disturbance gradients and references for streams in Michigan. Environmental Monitoring and Assessment 141: 1-17.

20. **Wang, L.,** *et al*. 2008. Erratum. Landscape based identification of human disturbance gradients and references for streams in Michigan. Environmental Monitoring and Assessment 144: 483-484.

21. Brenden, T.O., **L. Wang**, P.W. Seelbach, R.D. Clark, Jr., M.J. Wiley, and B.L. Sparks-Jackson. 2008. A spatially-constrained clustering program for river valley segment delineation from GIS digital river networks. Environmental Modeling and Software 23:638-649.

22. Brenden, T.O., **L. Wang**, P.W. Seelbach, R.D. Clark, and J. Lyons. 2007. Comparison between model-predicted and field-measured stream habitat features for evaluating fish assemblages-habitat relationships. Transactions of American Fisheries Society 136:580-592.

23. Wehrly, K., **L. Wang**, M. Mitro. 2007. Field-based estimates of thermal tolerance limits for trout: incorporating exposure time and temperature fluctuation. Transactions of American Fisheries Society 136: 365-374.

24. **Wang,L.,** D.M. Robertson, and P.J. Garrison. 2007. Linkages between nutrients and assemblages of macroinvertebrates and fish in wadeable streams: implication to nutrient criteria development. Environmental Management 39:194-212.

25. **Wang**, **L**., J. Lyons, and P. Kanehl. 2006. Responses of habitat and fish to agricultural best management

practices in a warmwater stream. Journal of the American Water Resources Association 42: 1047-1062.

26. **Wang**, **L**., B. Weigel, P. Kanehl, and K. Lohman. 2006. Influence of riffle and snag habitat specific sampling on stream macroinvertebrate assemblage measures in bioassessment. Environmental Monitoring and Assessment 119:245-273.

27. **Wang, L.,** P.W. Seelbach, and R.M. Hughes. 2006. Introduction to landscape influences on stream habitats and biological assemblages. American Fisheries Society Symposium 48:1-23.

28. Hughes, R., **L. Wang**, and P.W. Seelbach, Editors. 2006. Landscape influences on stream habitats and biological communities. American Fisheries Society Symposium 48, Bethesda, Maryland.

29. **Wang, L**., P.W. Seebach, and J. Lyons. 2006. Effects of levels of human disturbance on the influence of watershed, riparian, and reach scale factors on fish assemblages. American Fisheries Society Symposium 48:199-219.

30. Brenden, T.O., R.D. Clark, A.R. Cooper, P.W. Seelbach, L. **Wang**, S.S. Aichele, E.G. Bissell, and J.S. Stewart. 2006. A GIS framework for collecting, managing, and analyzing multi-scale landscape variables across large regions for river conservation and management. American Fisheries Society Symposium 48: 49-74.

31. Weigel, B.M., J. Lyons, and P.W. Rasmussen, and L. **Wang**. 2006. Relative influence of factors at multiple spatial scales on fishes in Wisconsin's nonwadeable rivers. American Fisheries Society Symposium 48:493-51.

32. Gaffield, S.J., K.W. Potter, and L. **Wang**. 2005 Predicting the summer temperature of small streams in southwestern Wisconsin. Journal of the American Water Resources Association 41:25-36.

33. Baker, E.A., K.E. Wehrly, P.W. Seelbach, L. **Wang**, M.J. Wiley, and T. Simon. 2005. Use of explicit statistical modeling to assess ecological stream condition in the Northern Lakes and Forest Ecoregion. Transactions of American Fisheries Society 134:697-710.

34. **Wang,** L. and M.B. Weigel. 2004. Biotic integrity indices for evaluating the health of freshwater resources. pp 36-41, *In*: J. H. Lehr (editor), The Encyclopedia of Water: Volume of the Surface and Agricultural Water. John Wiley and Sons, Hoboken, New Jersey.

35. **Wang,** L., and P. Kanehl. 2003. Influences of watershed urbanization and instream habitat on macroinvertebrates in cold-water streams. Journal of the American Water Resources Association 39:1181-1196.

36. Weigel, M.B., L. **Wang**, P.W. Rasmussen, J.T. Butcher, P.M. Stewart, T.P. Simon, and M.J. Wiley. 2003. Relative influence of variables at multiple spatial scales on stream macroinvertebrates in the Nothorn Lakes and Forest Ecoregion, USA. Freshwater Biology 48:1440-1461.

37. **Wang,** L., J. Lyons, and P. Kanehl. 2003. Impacts of urban land cover on trout streams in Wisconsin and Minnesota. Transactions of the American Fisheries Society 132:825-839.

38. **Wang**, L., J. Lyons, P. Rasmussen, P. Kanehl, P. Seelbach, T. Simon, M. Wiley, E. Baker, S. Niemela, and M. Stewart. 2003. Influences of landscape- and reach-scale habitat on stream fish communities in the Northern Lakes and Forest ecoregion. Canadian Journal of Fisheries and Aquatic Science 60:491-505.

39. **Wang**, L. and J. Lyons. 2003. Fish and benthic macroinvertebrate assemblages as indicators of stream degradation in urbanizing watersheds. pp 227-249, *In:* T. P. Simon (editor), Biological Response

Signatures: Indicator Patterns Using Aquatic Communities. CRC Press, Boca Raton, FL.

40. Stepennuck, K.F., R.L. Crunkilton, and L. **Wang**. 2002. Impacts of urban land use on macroinvertebrate communties in southeastern Wisconsin streams. Journal of the American Water Resources Association 38:1041-1051.

41. Goldstein, B., L. **Wang**, T.P. Simon, P.M. Stewart. 2002. Development of a stream habitat index for the Northern Lakes and Forests Ecoregion. Journal of North American Fisheries Management 22: 452-464.

42. **Wang**, L., J. Lyons, and P. Kanehl. 2002. Effects of watershed best management practices on habitat and fishes in Wisconsin streams. Journal of the American Water Resources Association 38: 663-680.

43. Stewart, J.S., L **Wang**, J. Lyons, J.A. Wierl, and R. Bannerman. 2001. Influences of watershed, riparian-corridors, and reach-scale characteristics on aquatic biota in agricultural watersheds. Journal of the American Water Resources Association 37:1475-1487.

44. **Wang**, L., J. Lyons, P. Kanehl, and R. Bannerman. 2001. Impacts of urbanization on stream habitat and fish across multiple spatial scales. Environmental Management 28:255-266.

45. **Wang**, L., J. Lyons, P. Kanehl, R. Bannerman, and E. Emmons. 2000. Historical fish assemblage changes and watershed urban development in southeastern Wisconsin streams. Journal of the American Water Resources Association 36:1173-1189.

46. **Wang**, L., J. Lyons, and P. Kanehl. 1998. Development of evaluation of a habitat rating system for low gradient Wisconsin streams. North American Journal of Fisheries Management 18: 775-785.

47. **Wang**, L., J. Lyons, P. Kanehl, and R. Gatti. 1997. Influence of watershed land use on habitat quality and biotic integrity in Wisconsin streams. Fisheries: 22 (6): 6-12.

48. **Wang**, L., T.D. Simonson, and J. Lyons. 1996. Accuracy and precision of selected stream habitat estimates. North American Journal of Fisheries Management 16:340-347.

49. Lyons, J., L. **Wang**, and T.D. Simonson. 1996. Development and testing of an index of biotic integrity for coldwater streams in Wisconsin. North American Journal of Fisheries Management 16:241-256.

50. **Wang**, L., K. Zimmer, P. Diedrich, and S. Williams. 1996. The two-story rainbow trout fishery and its effect on the zooplankton community in a Minnesota lake. Journal of Freshwater Ecology 31:183-190.

51. **Wang**, L. and R. White. 1994. Competition between brown trout and hatchery greenback cutthroat trout of largely-wild parentage. North American Journal of Fisheries Management 14:475-487.

52. **Wang,** L. and J.C. Priscu. 1994. Stimulation of aquatic bacterial activity by planktonic cyanobacteria. Hydrobiologia 277:145-158.

53. **Wang,** L. and J.C. Priscu. 1994. Influence of phytoplankton on the response of bacterioplankton growth to nutrient enrichment. Freshwater Biology 31: 183-190.

54. Shi, W, D. Xia, S. Deng, L. **Wang,** and X. Lu. 1994. The relationship among reservoir environmental factors and fish growth and productivity. Limnology and Oceanography 25(1):77-86 (in Chinese).

55. **Wang**, L., T. Miller, and J.C. Priscu. 1992. Bacterioplankton nutrient deficiency in a eutrophic lake. Archiv Fur Hydrobiologie. 125(4):423-439.

56. Kangatharalingam, N., L. **Wang**, and J.C. Priscu. 1991. Evidence for bacterial chemotaxis to cyanobacteria from a radioassay technique. Applied and Environmental Microbiology 57:2395-2398.

57. Kangatharalingam, N., L. **Wang**, and J.C. Priscu. 1990. An *in situ* technique to measure bacterial chemotaxis in natural aquatic environment. Microbial Ecology 20:3-10.

58. Dong, S., W. Shi, **L. Wang**, D. Xia. 1989. Reservoir plankton community structures and seasonal variation in Liaoning Provence. Journal of Dalian Fisheries University 4:1-10 (in Chinese with English abstract).

59. Shi, W., S. Dong, D. Xia, **L. Wang**. 1988. Ecological characteristics of 13 reservoirs in Liaoning Provence. Journal of Dalian Fisheries University 1:71-74 (in Chinese with English abstract).

60. Shi, W., S. Dong, **L. Wang**. 1987. Productivity comparison of two shallow reservoirs with and without macrophytes. Journal of Dalian Fisheries University 1:11-18 (in Chinese with English abstract).

61. **Wang**, L., Y. Li, and W. Shi. 1982. Factors influencing the population sizes of Erythoculter ilisaeformis and E. dabryi in Dahufang Reservoir. Transactions of Liaoning Association of Zoologists 2:17-22 (in Chinese with English abstract).

Thesis, Proceedings, and Federal Agency Technical Publications:

1. Robertson, D.M., D.J.G. Graczyk, P.J. Garrison, **L. Wang**, and G. LaLiberte. 2006. Impacts of nutrients on the biological integrity of wadeable streams in Wisconsin. U.S. Geological Survey Professional Paper No. 1722, 140 pp.

2. Corsi, S.R., J.F. Walker, L. **Wang,** J.A. Horwatich, and R.T. Bannerman. 2005. Effects of best-management practices in Otter creek in the Sheboygan River Priority Watershed, Wisconsin, 1990-2002. U.S. Geological Survey Scientific Investigations Report 2005-5009.

3. Stewart, J.S., D.M. Downes, L. **Wang**, J.A. Wierl, and R. Bannerman. 2000. Influences of riparian corridors on aquatic biota in agricultural watersheds. Proceedings of the AWRA International Conference on Riparian Ecology and Management in Multi-Land Use Watersheds, August 27-31, 2000, Portland, Oregon, U.S.

4. **Wang**, L. J. Lyons, P. Kanehl, D. Marshall, and M. Sorge. 2000. Responses of stream habitat, macroinvertebrate, and fish to watershed BMPs: lessons from Wisconsin. Proceedings of Water Environment Federation International Conference of Watershed 2000, Vancouver, Canada.

5. **Wang,** L. 1992. Control of bacterioplankton activity in a eutrophic lake: emphasizing relationships among bacteria, cyanobacteria, and nutrients. Ph.D. Dissertation, Montana State University, Bozeman, Montana.

6. **Wang**, L. 1989. Behavior and microhabitat competition of brown trout and greenback cutthroat trout in an artificial stream. Ms. Thesis, Montana State University, Bozeman, Montana.