CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

A study of Diversity of Benthic Diatoms during 2011-2012 for Water Quality Index Establishment of Wang River were carried out from October 2011 – September 2012. The physical, and chemical water properties of the diatom samples were investigated every month for a period of a year from 12 sampling sites in the Wang River including upstream to downstream sites taken from both the mainstream areas and certain reservoirs of the river. A total of two hundred and twenty species of benthic diatoms were found in the Wang River, two hundred thirteen species were found in the main river and one hundred nineteen species were found in the reservoirs. These were classified into 3 classes, 5 subclasses, 12 orders, 25 families and 53 genera. Of these, 42 species were recorded for the first time in Thailand and a single species was described as a new species of diatoms in the name of *Cymbella* cf. *bifurcumstigma* Nakkaew, Peerapornpisal and Mayama, sp. nov. (which is currently in the publication process).

The water quality of some areas of the Wang River was determined by the Applied Algal Research Laboratory-Physical and Chemical Score (AARL-PC score), which was based on trophic status and showed mostly clean to moderate quality. The water samples taken from these sites were classified in the oligotrophic-mesotrophic status. In this investigation, beneficial applications of the results from the samples were classified by the standard for surface water quality of Thailand into class 3, which indicates that they could be appropriate for use in agricultural, industrial, communication purposes, as well as for consumption. However, the water had to undergo special treatment before it could determined to be acceptable for consumption.

The benthic diatoms of the Wang River in a total of 100 species, which revealed high relative abundance were selected for the purposes of establishing the Wang Diatom Index with values between 2.5-4.4 based on 4 main environmental factors, such as BOD, nitrate nitrogen, ammonium nitrogen and SRP. The computation of the trophic status by

the Wang Diatom Index resulted in a classification of the oligo-mesotrophic to meso-eutrophic status or clean-moderate to moderate-polluted water quality. The results of the comparison between the trophic status by using the indicator values from the Wang Diatom Index with other indexes showed slight differences with Thailand's indexes, such as with regard to the Mea Sa Diatom Index (2002), the Mekong Diatom Index (2009) the Ping and Nan Diatom Index (2005), Thailand Diatom Index (2011) as well as the Yom Diatom Index (2014), while results showed highly differences when compared with the foreign indexes originating outside of Asia, such as the Van Dam Index (1994) and the Rott Index (1997). In addition, the Wang Diatom Index could be used to indicate the trophic status for other rivers of Thailand.

6.2 Recommendations

6.2.1 The Wang Diatom Index was achieved by analyzing data over a twelve-month period in a single year. However, a long-term period of investigation should be carried out continuously for more precise and accurate index.

6.2.2 The water quality of the Wang River in urban and municipal areas revealed polluted water by ammonium nitrogen and BOD concentrations; thus, this area needs support from the government or other organization to bring greater awareness to people for the purposes of protecting the water resource and minimizing increases in water runoff.

6.2.3 From this study, the samples of two reservoirs of the Wang River were investigated; however, the data and samples from the standing water should be analyzed in greater depth because highly useful guidelines can be arrived at as a result of this study. Consequently, the study of the benthic diatoms in lakes or reservoirs in other areas should also be considered of significant value due to the fact that it could be continually used to apply the trophic index for water quality assessment in standing water.