CHAPTER 5

CONCLUSION

The aims of this study were to assess water quality of the Mae Kham Watershed by using physico-chemical properties together with biological properties, including the comparison between biological indices that were suitable for the watershed. The conclusions of this study were as follows:

1. Ten orders, 86 families and 241 morphotaxa of aquatic insects were identified. The most abundant family during the year was Baetidae (Ephemeroptera). Site 6 was upstream with less contamination by human activities. Numerous aquatic insect families, particularly the insects in Trichoptera Order were discovered there.

2. Using physico-chemical parameters to compare the water quality to the water quality standard of Thailand, the streams were classified into 3 groups. Site 1 was classified in class 3 with medium clean water resources. Sampling site 2, site 3, site 4 and site 5 were classified in class 2 with very clean water resources and sampling site 6, site 7 and site 8 were classified as being extra clean water resources. Water quality depended on land use and human activities beside each stream. The results were related to biological indices.

3. The biological indices were used. HBI index was not appropriate to be used in small streams in which almost all macroinvertebrates were insects. Whereas, from the result, the diversity index was appropriate for use in the watershed area but the quantitative index should be considered. The high diversity levels might have been from order Diptera which occurred in polluted water. The EPT ratio was suitable for use but it should be applied for Thailand. ASPT (based on $BMWP^{Thai}$) was more suitable for use at the Mae Kham Watershed than other indices. From those indices, sampling site 6, site 7 and site 8 were indicated as having good water quality, while sampling site 2, site 3, site 4 and site 5 had moderate water quality and sampling site 1 had quite polluted water.

4. Using cluster analysis, the water quality in all sampling times could be classified into 4 groups by using the physico-chemical properties and could also be classified into 4 groups by using the diversity of aquatic insects. Nevertheless, the water quality in each sampling site was not obviously different. PCA analysis could expose the correlation between aquatic insect orders and water quality with conductivity, nitrates and phosphates. The biological indices were related to water quality in some physico-chemical properties. ASPT, EPT ratio and diversity index were related to some parameters such as velocity, DO, alkalinity and conductivity.