Chapter 5

Conclusions and Discussion

5.1 Conclusions

The highest proportion of catch weight of low value fish was 27.2% in 2006; with most (72.3%) caught by set bag net. The freshwater invertebrate was not found in the landing record. The estuarine vertebrates were the largest portion of catch (39.7%).

There were 1, 2, 3, 8 and 9 species (1, 2, 3, 6 and 6 families), respectively, in the estuarine invertebrates, marine invertebrates, freshwater vertebrates, estuarine vertebrates and marine vertebrates.

The time series plot for each of marine invertebrates, estuarine vertebrates and marine vertebrates was similar in the plot for total low value fish, with a peak in March. Also, the low value fish caught by trap, set bag net and gill net had peaks in June, March and July, respectively, and each had a similar pattern for each year. In addition, the freshwater vertebrates had peaks in July-August and estuarine invertebrates had various peaks.

The linear models of the total value fish and categories by gear were moderately acceptable. Conversely, the linear models were extremely acceptable for estuarine invertebrates and the linear models of other groups were greater acceptable. Sum contrast of month-year factor shows the seasonal pattern of low value fish, it is rather consistent with the data.

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5.2 Discussion

The highest proportion of catch weight of low value fish was 27.2% in 2006; with most (72.3%) caught by set bag net. The freshwater invertebrate was not found in the landing record. The estuarine vertebrates were the largest portion of catch (39.7%). When compared to other studies, Stobutzki *et al*. (2005) reported 47.5% of trash fish by weight in coastal fisheries of Thailand and Malaysia, Grainger *et al.* (2005) reported the catch of low value fish was 15.7% of total catch in China. The result found the maximum catches in species *Rasbora lateristriata*, *Ambassis gymnocephalus*, *Ambassis marianus* and *Thryssa dussumieri*, while other studies found in families Leiognathidae (Khemakorn *et al*., 2005, Stobutzki *et al*., 2005), Nemipteridae (Khemakorn *et al*., 2005), Engraulidae, Mullidae, Synodontidae and Apogonidae (Stobutzki *et al*., 2005). *Scomber japonicus and Torpedo torpedo* (Goncalves *et al*., 2007).

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The time series plot for each of marine invertebrates, estuarine vertebrates and marine vertebrates was similar in the plot for total low value fish, with a peak in March. This can be explained that many species of marine fish migrated into the lake (Chesoh and Choonpradub, 2009). Freshwater vertebrates had peaks in July-August and estuarine invertebrates had various peaks. This can be explained that many freshwater fish moved to spawning ground during July and August then they were easy to be caught (Chesoh and Lim, 2008). The result also found that, most of the low value fish landed around the Lake consist of small fish and ornamental fish that have a significant role in the food chain (Froese and Pauly, 2009).

The linear models of the total low value fish and categories by gear were moderately acceptable because all fishing gears used in the Lake are selective fishing gears that are accidentally caught along with more abundant species, size, position setting and timing of each gear (Valdemarsen and Suuronen, 2001), and the linear models of other groups were greater acceptable. Especially, the linear models were extremely acceptable for estuarine invertebrates. Perhaps this difference was because the linear models of estuarine invertebrate had 1 species, but the other linear model had a variety of species.

The overall catch of low value fish increased, trend showed the catch in 2006 was statistically significant (p-value<0.0001), higher than those in 2003 and from March to December showed statistically significant higher than those in January, whereas Khemakorn *et al*. (2005) found the trends of commercial landings catch of trash fish and low value food fish were slightly decreased and Komontree *et al*. (2006) was no detectable trend in the trash fish.

In this study, the low value fish is defined as the fish species that were caught by three major fishing gears and landed at fish port around Songkhla Lake, and had a unit price equal or not exceeding 25 baht per kilogram. This referred to Khemakorn *et al*. (2005). However, some previous studies have defined low value fish as the juveniles or small-size of some commercial species, or trash fish (Stobutzki *et al*., 2005; Goncalves *et al*., 2007; Monteiro *et al*., 2007; Cornelio *et al*., 2008).

Although the low value fish or trash fish is growing demand for livestock/aquaculture fish feeds in the aquaculture feeds (Lungren *et al*., 2006), but even so the overall fishing effort in the Lake was fairly stable over time because both fishing gear and number of fishermen did not change substantially (Chesoh and Choonpradub, 2009). Consequently, to sustain the species' diversity and abundance of these fish species,

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establishing a fish sanctuary and restricting the fishing season and enforcing of fishing regulations in the Lake are urgently desirable.

5.3 Limitations and suggestion for further study

Only fish catches from the three main fishing gears that landed at the major 10 fishing ports were collected. In fact, there are many fish landing around the Lake, directly to the local markets, the fish size, catch by other gears and fish caught for self-consumption but not recorded in landing records. The data were not taken into account in this study and were not taken into account in the model.

Many of valueless fish were thrown away in the Lake prior to landing at fishing port. Thus, these amounts of low value fish were not taken into account the model.

Further study should be emphasized on the utilization of low value fish.

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