Nile perch (Mputa), was introduced into lakes Kyoga, Victoria and Nabugabo from lake Albert. The purpose of the introduction was to increase fish production in these lakes by letting the Nile perch feed on the small sized haplochromines (Nkejje) which were abundant in these lakes and converting them into a larger table fish. It was, however, feared that Nile perch would prey on and deplete stocks of the native fishes and affect fish species diversity. Nile perch became well established and is currently among the three most important commercial species. It is presently the most important export fish commodity from Uganda. Considerable changes have taken place in the yield and in life history characteristics of the Nile perch itself since the predator got established in lakes Victoria and Kyoga.

10.1. Yield to the fisherman

After establishment of the Nile perch, fishery yield in lakes Kyoga and Victoria increased five to eight times. Total yield in the Ugandan region of Lake Victoria increased from 17,000 tonnes in 1981 to 132,000 tonnes by 1989 due to increase in contribution of Nile perch from 14,000 tonnes in 1983 to 101,000 tonnes in 1989. Similarly, fishery yield in Lake Kyoga increased from 18,000 tonnes in 1964 to 167,000 tonnes in 1978 due to the rise in the contribution of Nile perch from about 700 tonnes to 71,000 tonnes. However, the yield of Nile perch in Lake Kyoga later decreased to 15,000 tonnes by 1989 suggesting that Nile perch may not sustain the high yields realised soon after its establishment in the new habitats. This decline has been attributed to heavy fishing pressure, use of destructive fishing gears and methods especially beach seines, and reduction in food of the Nile perch.

10. 2. Impact on fish species diversity

Before establishment of the Nile perch, up to 14 fish species occurred in the commercial catches. After its establishment, the number of exploited fish species decreased to three, Nile perch, Nile tilapia and one native species; *Rastrineobola argentea* (Mukene). Although the original decline was due to overfishing, that after establishment of Nile perch was mainly due to predation by the Nile perch. Since 1991 stocks of haplochromines and other native species have started to increase in Lake Kyoga. This seems to be due to the reduction in predation pressure as a result of over-fishing of Nile perch and the increase in cover from predation provided by the expansion of the water hyacinth.

10.3. Food of Nile perch

Before Nile perch become well established in lakes Victoria and Kyoga, haplochromines and small mormyrids (Kasulu) were its main food. As populations of Nile perch increased, stocks of haplochromines and other native

species declined. Thereafter prawns, *Caridina nilotica* and dragonfly nymphs became the dominant prey of juvenile Nile perch while larger Nile perch ate Mukene, Nile tilapia and its own young (Figure 6). The average sizes and numbers of prey eaten also changed. Following increases in haplochromine stocks in Lake Kyoga since 1991, haplochromines have again become important food of Nile perch in the lake (Figure 6). Similar increases in haplochromine stocks have started to occur in inshore areas of Lake Victoria and in Lake Nabugabo indicating that the lakes to which Nile perch was introduced are starting to exhibit predator-prey cycles.

10.4. Condition factor

Nile perch in the new habitats were initially heavier and fatter than in native habitats due to abundance, at that time, of vulnerable haplochromine prey. After haplochromines had been depleted, the average weight of the fish decreased and they are now lighter than even in their original habitat. Reduction in Nile perch prey through human over-exploitation can depress the condition of the Nile perch to levels that would affect the health of its stocks and should be avoided. There is therefore need to control exploitation of Nile perch prey.

10.5. Reproduction

Male Nile perch mature at 50 - 55 cm total length and females at 90 - 100 cm. The species has a very high reproductive potential; females produce 3 to 18 million eggs depending on size. There are more males than females in lakes Victoria and Kyoga than was the case soon after introduction of the predator into these lakes. Although reproductive potential of the Nile perch does not seem threatened by changes in prey supply due to the very large numbers of eggs produced, the male biased sex ratio might effect the rates of replacement of the stocks.

10.6. Future of Nile perch Fishery

The decline in the yield of Nile perch in Lake Kyoga, the reduction in prey abundance in its new habitats, the reduction in the condition factor of the predator combine with the male biased population to suggest that Nile perch may not sustain the very high yields realised soon after its establishment in Lakes Victoria and Kyoga. This situation is compounded by the excessive fishing pressure on the species due to the very high demand for fish by the increasing population, the export oriented fish processing plants especially on Lake Victoria.

10.7. Recommendations

Two main factors seem to have contributed to the decline in the Nile perch stocks and the condition factor of the fish. The first one has been the extensive use of beach-seines and small mesh gill-nets. In order to overcome this, it will be

necessary to eliminate destructive fishing gears and methods control fishing effort (number of fishermen, boats, fish processing plants and their capacity). The second contributing factor seems to be the changes and reduction in the quantity and probably quality of the prey available to the predator. The main prey species (Mukene, Nile tilapia and Nile perch itself) are also the main commercial fish species. There is, therefore competition between Nile perch and the fishery. It will be necessary to consider this when designing of management option for the lakes.