

Further data analysis on mean numbers of YOY walleye taken in bottom trawl drags confirm a consistent increase in walleye stocks since 1978 (Table 32).

### 3.8.2 Fish Community Structure

For many decades prior to the 1950s, the Bay of Quinte supported a community dominated by lake herring, lake whitefish, walleye, yellow perch and northern pike (Hurley 1986). For example, lake herring and lake whitefish traditionally migrated into the bay and spawned, and the early life stages of these species remained in the bay. As well, various species of centrarchids, ictalurids, and osmerids, were well-represented locally, and clupeids entered the bay in spring and spawned, and the young spent their first year or two of life there. This community was a mesotrophic one and both species diversity and persistence were high. However, with increased loads of artificial phosphorus occurring between the mid-1940s and 1970s, the upper bay passed quickly through mesotrophy to eutrophy to hypertrophy; many changes to the fish community paralleled this enrichment process. First, by the mid-1940s, lake herring largely disappeared, probably as a result of predation on their young by osmerids (Christie, 1973). Second, lake whitefish survived to the 1960s but succumbed to the effects of predation by white perch and degraded spawning habitat (Hurley and Christie 1977). Third, walleye populations crashed in the mid-1960s, possibly because of white perch predations; as noted earlier, white perch invaded the bay and proliferated in the 1960s and early 1970s. By the early 1970s the upper bay was dominated by white perch and alewife, with ictalurids and catostomids persisting, and centrarchids reduced. Interestingly, yellow perch persisted, despite the pressure of white perch. Throughout this period of hypertrophy, small numbers of walleye continued to spawn in the rivers draining to the upper bay, although survival was thought to be poor. As well, a few whitefish persisted in the relatively mesotrophic Trent River.

At the same time that sharp reductions in phosphorus loads were occurring (i.e., the late 1970s and early 1980s), changes in fish populations were observed. However, as noted by Hurley (1986), a significant part of the

Table 32. Mean number of age 0 walleye per hectare from bottom trawl drags in the Bay of Quinte, May-October

Year	Location		
	Big Bay	Hay Bay	Conway
1987	5.7	13.9	15.5
1986	49.5	21.2	22.8
1985	17.8	18.8	0.0
1984	1.6	5.0	0.0
1983	2.5	2.5	4.4
1982	32.7	0.0	0.0
1981	5.5	1.5	0.8
1980	0.0	0.0	0.0
1979	0.0	3.4	0.0
1978	29.4	12.2	0.0
1977	0.0	0.0	0.0
1976	0.0	0.0	0.0
1975	0.0	0.0	0.0
1974	0.0	0.0	0.0
1973	0.0	0.0	0.0
1972	0.0	0.0	0.0

On the bases of information provided in the Guide to Eating Ontario Sport Fish (1988), contaminant levels have been determined and assessed for 14 species of fish at seven locations throughout the Bay of Quinte (Appendix J). While acceptable levels occur in most species and sizes, PCB and Mirex in excess of provincial and federal guidelines for consumption are persisting in large size classes of walleye, American eel and channel catfish. Walleye greater than 65 cm in length and channel catfish greater than 55 cm in length should not be consumed at all. As noted by Beak Consultants Limited (1988), trends to declining levels have been observed in most fish species;

### 3.8.3 Fish Contaminants

early 1980s. not known, they appear to be close to those present in the late 1970s and Hurlley (1986) speculated that while the exact water quality conditions are appears to depend on some reasonable level of water quality. In this regard, community will depend on a significant number of piscivores, which, in turn, similar to that of the 1940s and early 1950s. The persistence of such a be a harbinger of an even less productive, mesotrophic fish community, dominated. Further, the recent appearance and increase in lake whitefish may community structure), when percids, clupeids, ictalurids, and centrarchids to resemble that of the late 1950s and early 1960s (i.e., a eutrophic the present community appears to be reasonably balanced and it is beginning of piscivores suggest a reversal of the eutrophication process; specifically, In summary, the reduced phosphorus loads coupled with the increased abundance condition are now regularly taken in the upper bay in the fall (Hurlley 1986).

more abundant in the lower bay, and small numbers of adults in spawning declined. Recent evidence is also strong that lake whitefish are becoming smallmouth bass, became more numerous after the mid-1970s, while alewife improvement in their rate of survival. As well, centrarchids, particularly information on the presence of several year classes indicates a generalized and especially in 1978, walleye abundance rose dramatically; more recent than normal temperatures in the winter of 1977-1978. Concurrently in 1977, fish community change was due to climatic extremes which resulted in cooler