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Comparative Catchability, Growth, and Survival of Two Wild Stocks of Brown Trout

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Abstract. –The catchability and genetic growth potential of trout may be changed, over time, by differential angler harvest of more catchable and faster-growing fish from each cohort. To test this hypothesis, yearling brown trout *Salmo trutta* from the Au Sable River and Gilchrist Creek were stocked into Fuller Pond. Brown trout populations from the Au Sable River were believed to have been historically exploited more intensively than those in Gilchrist Creek. We compared their vulnerability to capture by angling, relative growth, and survival over a 2.5 year period. Using artificial flies and lures, Gilchrist fish were approximately four times easier to catch at age 2, and three times easier to catch at age 3 than Au Sable fish. Vulnerability to angling was not correlated with growth rates, as few significant differences occurred in growth. There was also no difference in survival of the two strains during the study period. Differential angler exploitation over time may have altered catchability of these wild trout stocks. Other factors that could account for observed differences in catchability include genetic dissimilarity of founder stocks, genetic differences due to differences in natural selection between the rivers, or unknown factors. By selection of appropriate brood stocks, fishery managers could double or quadruple brown trout catch rates for some catch-and-release fisheries that are established or maintained by stocking. Conversely, managers could reduce angler exploitation rate, thus permitting trout to grow for a greater length of time in harvested fisheries, by stocking strains that are less catchable.

The genetic potential for growth may become degraded by differential angler harvest, over time, of the more catchable and faster-growing fish from each cohort, thus leaving the slower growers to reproduce the stock. Alexander (1987) reported that wild brown trout *Salmo trutta* populations that were believed to have been exposed to high levels of size-selective exploitation grew more slowly than lightly exploited stocks. Cooper (1952) showed that anglers differentially exploited faster-growing brook trout *Salvelinus fontinalis* in the Pigeon River. Brauhn and Kincaid (1982) and Dwyer and Piper (1984) found that rainbow trout *Oncorhynchus mykiss* strains which were genetically selected for faster growth were more vulnerable to angling than slower-growing domestic or wild strains. Catchability may also vary between stocks for reasons other than growth rate. Dwyer (1990) reported that catchability of three strains of cutthroat trout *Oncorhynchus clarki* appeared to be directly related to their degree of domestication. Nuhfer and Alexander (1991) found that wild brook trout stocks from two branches of the Au Sable River were harder to catch than wild stock from the