Testimony on Causes of the Decline in Striped Bass

Since introduction in the late 1800s, and a century of relatively stable population, it is clear that in the last 15 years, the striped bass population has declined to 1/4th to 1/5th of the historic population.

In diagnosing population declines, it is generally useful to distinguish between deteriorating habitat and changes in vital rates of the population. In a one-time decline in habitat, the population should respond by a <u>one-time adjustment</u> of the population size to the dimensions of the new habitat. A change in a vital rate, however, would lead to a <u>continual decline</u> of the population.

The 'vital rates' referred to above include the egg production rate of the adults, and the survival rates of the eggs, larvae, juveniles, and adults. The usual effect of a sport or commercial fishery is to decrease the survival rate of the adults. This in turn decreases the egg production. Survival rates of the eggs, larvae, and juveniles are usually influenced directly or indirectly by the environment. In a population which has been stable for many decades, changes in survival due to direct influences of the natural environment may be rare; an indirect influence on survival is more likely. Examples of indirect influences would be transport of life stages out of the

habitat such as by water exports from the Sacramento-San Joaquin Delta, slowing of growth rates by food shortages, and increasing mortality of eggs, larvae, and juveniles due to increases in predators.

The chief distinction between habitat deterioration and a change in a vital rate is that in the case of habitat deterioration, the population should adjust to the new habitat and stabilize; conversely, a deleterious change in a vital rate will continually decrease the population toward extinction. Unless losses are lowered, the population will likely continue to decline. The most tractable loss under control at the present time appears to be the loss of young fish entrained in water diversions. Since costs of reducing such losses are high, any program implemented to reduce entrainment losses should be monitored carefully and re-evaluated in 5 years or so.

It is reasonable to believe that the recent decline of the striped bass population is principally due to losses of young fish in water exports.

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