1994). This statistical procedure allowed EPA to separate the effects of year-to-year variability in precipitation from the effects of increased levels of upstream development.²²

The results of these recomputations are shown graphically in Figures 1 and 2. The response surface or curved plane in Figure 2 shows how the number of days of 2 ppt salinity at Roe Island changes with both the precipitation (flow) and the changing level of development over time. Figure 1 shows several "slices" of the curved plane in Figure 2. Each of these different slices corresponds to a particular year's level of development (1940, 1958, 1968, and 1975), and show how the number of 2 ppt days would have varied over different hydrological conditions at that year's level of development. Historically, of course, each year

experienced only one hydrological scenario; the purpose of the regression equations for these four different years is to show how that particular level of development would have influenced the position of the 2 ppt isohaline over the entire range of possible hydrological conditions.

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Having adjusted the historical data to account for the effects of the level of development, EPA must still determine the appropriate reference period for defining the final criteria. The final criteria must adequately reflect conditions in the estuary at a time period during which the estuary attained the designated uses, regardless of the causes of degradation to the waterbody.

In the final rule, EPA is establishing Estuarine Habitat criteria that replicate the "level of development" existing in 1968. The intent of these criteria is to protect the Estuarine Habitat designated use to the same degree that these uses would have been protected under the level of development present in 1968.

EPA chose the 1968 level of development because the best available information indicates that at that time, salinity conditions in the Bay/Delta were adequate to protect the estuarine habitat. As explained in the Proposed Rule, EPA, NMFS, and USFWS have called for a level of protection equal to that which existed in the late 1960's and early 1970's. EPA believes that the fish population data summarized in the San Francisco Estuary Project's Status and Trends Report document the precipitous and unreversed decline of the most abundant species beginning in 1970. (Herbold et al. 1992). This downward trend is also apparent in the population

data for winter run Chinook salmon. (Herbold et al. 1992).

In choosing a particular year, EPA is not suggesting that the particular hydrological conditions in 1968 are being replicated. Instead, the use of an individual calendar year appears to be a reasonable surrogate for the level of development for that period. As the graph in Figure 2 suggests, there would not be a substantial difference between number of days of meeting the 2 ppt salinity value in 1968 versus 1967 or 1969. EPA has chosen the 1968 value as a reasonable representation of the period in which the estuary was attaining its designated uses.

If the Estuarine Habitat criteria were stated on an annual basis as it was in

²² In that this statistical procedure allowed the effect of the changing level of development to be controlled, the issue of the proper data set (i.e., group of reference years) to be included in the

description of historical hydrological conditions essentially disappears. To take advantage of all appropriate historical data, in performing these computations EPA used data from the years 1930

⁽when accurate records were first available) to 1978 (when the hydrological conditions in the Delta were first substantially affected by the regulatory measures adopted by the State Board).