

Figure 1. Predicted number of days of compliance with 2 ppt criteria during February to June at four levels of development across a range of unimpaired flows.

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(II) Selecting sliding scale values: the reference period that would reflect protection of the designated uses. Having concluded that the logistic equation is the best form of sliding scale for the Estuarine Habitat criteria, EPA still needed to determine the appropriate reference period reflected in that logistic equation.

In the Proposed Rule, EPA chose as the reference period the late 1960's to early 1970's. Available information suggested that during this period the estuarine conditions were able to support the designated uses. To describe the conditions in this late 1960's to early 1970's reference period, the Proposed Rule used hydrological and salinity data from 1940 to 1975. This longer period was used because the actual conditions in the late 1960's to early 1970's did not provide representative samples of the possible broad range of precipitation conditions in the estuary.<sup>20</sup> The Proposed Rule suggested that the period 1940-1975 could be considered representative of the late 1960's to early 1970's because the longer period was one of fairly consistent hydrological conditions

bracketed by the completion of Shasta Dam on the Sacramento in the early 1940's and by the severe drought of the mid-1970's.

EPA received substantial comment about its choice of an historical reference period to define the targeted level of protection for the Estuarine Habitat criteria. One group of comments criticized the choice of the years included in the reference period. Various other historical periods were discussed by different commenters as alternatives. (Bay Institute 1994, California DWR 1994, and NHI 1994). EPA's specific responses to these comments are in the comment response document included in the record to this rule.

A second set of comments raised a more fundamental problem with the use of an historical reference period. These comments argued that the choice of any particular historical reference period was inherently suspect if it could not account for the changing "level of development" (that is, the changing system of dams, diversion facilities, storage reservoirs, etc.) during the 1940 to 1970 period (California DWR 1994). For example, if exactly the same amount of precipitation had fallen in each of 1940 and 1970, the different "level of development" in each year would affect

how much water actually made its way down the rivers into Suisun Bay. In other words, the level of development, independent of the amount of rainfall, would affect the number of days that the 2 ppt salinity value was attained in Suisun Bay. Without accounting for the level of development, it would be hard to use rainfall data from the 1940's to represent conditions in the late 1960's to early 1970's.

EPA is persuaded that addressing these concerns about the effects of the level of development on resulting salinity criteria is, to a certain extent, appropriate. EPA and others (notably, the CUWA scientific workshops) have presented and discussed methods for accounting for the level of development. The Final Rule includes a straightforward approach to this issue. Standard statistical regression analysis was used to isolate the effects on the number of days of 2 ppt salinity of (1) the level of development, represented by calendar year,<sup>21</sup> and (2) precipitation (Kimmerer 1994b; Ferreira and Meyer

 $<sup>^{20}\,\</sup>rm In$  fact, no dry or critically dry years, and only one above normal year occurred during the late 1960's to early 1970's.

<sup>&</sup>lt;sup>21</sup>The use of the calendar year as a surrogate for the level of development is reasonable up until the late 1970's, because up until that time there was a fairly consistent increase year-by-year in the number and capacity of diversion and storage facilities, and the significant changes to the salinity regime imposed by the 1978 Delta Plan had not yet taken effect.