typically growing in saline soils, especially cordgrass (Spartina foliosa). This has been associated with erosion of the marsh margins. In addition, tules in the upper intertidal zone have been replaced by the smaller and more salt tolerant alkali bulrush (Scirpus robustus). These changes have significantly affected available habitat for a variety of wildlife that nest and feed in these areas, including the Suisun song sparrow, marsh wren, common yellowthroat, black-crowned night heron, and snowy egret (Collins and Foin 1993; Granholm 1987a; 1987b). The loss of habitat for the Suisun song sparrow is of particular concern, since individuals of this species are found only in the already fragmented marshes bordering Suisun Bay, occupy an established territory for their lifetime, and depend on tall tules for successful reproduction and cover from predators (Marshall 1948).

There are currently no salinity criteria protecting the brackish tidal marshes of Suisun Bay, although there is some incidental protection provided by salinity criteria protecting the managed non-tidal marshes. EPA's approval of the 1978 Delta Plan criteria explicitly sought and received assurances from the State Board to develop additional criteria for the brackish tidal marshes and to protect aquatic life in the Suisun Marsh channels and open waters. Because these assurances have not been met, EPA, in its September 3, 1991 letter on the 1991 Bay/Delta Plan, disapproved the standards for Suisun Marsh and stated that the State Board should immediately develop salinity objectives sufficient to protect aquatic life and the brackish tidal wetlands surrounding Suisun Marsh.

In its Proposed Rule, EPA relied on the Estuarine Habitat criteria to protect the tidal wetlands bordering Suisun Bay, and did not propose separate standards in the Suisun Marsh. EPA's proposed criteria were developed to protect aquatic species and to provide salinity conditions similar to those in the late 1960's to early 1970's. Therefore, many of the aquatic species that inhabit the marsh channels would receive increased protection once the Estuarine Habitat criteria are implemented. In addition, the Estuarine Habitat criteria were designed to provide substantially better dry and critically dry year springtime conditions than the recent conditions that have caused adverse effects on the tidal marsh communities bordering Suisun Bay. EPA therefore concluded that these Estuarine Habitat criteria would lead to substantially improved conditions in the marshes.

In its Proposed Rule, EPA solicited comment as to whether the Estuarine Habitat criteria should be supplemented by additional criteria to fully protect the tidal marsh resources. For illustrative purposes, EPA included two possible narrative criteria in the Proposed Rule:

(1) "water quality conditions sufficient to support high plant diversity and diverse wildlife habitat throughout all elevations of the tidal marshes bordering Suisun Bay"

(2) "water quality conditions sufficient to assure survival and growth of brackish marsh plants dependent on soils low in salt content (especially *Scirpus californicus* and *Scirpus acutus*) in sufficient numbers to support Suisun song sparrow habitat in shoreline marshes and interior marsh channel margins bordering Suisun Bay."

EPA received a number of substantive comments on this issue. The State Board and the California DWR opposed additional criteria, believing that any such criteria would be premature pending completion of a biological assessment in the marsh (SWRCB 1994; California DWR 1994). The California DFG recommended adoption of the numeric salinity criteria included in the Suisun Marsh Preservation Agreement signed by California DFG, California DWR, the USBR, and the Suisun **Resource Conservation District in 1987** (California DFG 1994). Two environmental organizations, Natural Heritage Institute and the Bay Institute, recommended that additional standards be developed for the Suisun Marsh. Relying primarily on scientific studies that had been prepared and submitted to the State Board's D-1630 hearings (Jocelyn 1992, WRINT-NHI-12; Williams 1992, WRINT–NHI–18), these groups raised questions about whether the EPA Estuarine Habitat criteria would adequately protect the brackish marshes during January and February, or during a multiple year drought, and whether the Estuarine Habitat criteria would adequately protect the interior tidal channels of Suisun Marsh. In its comments, NHI recommended the adoption of numeric salinity criteria (NHI 1994). The Bay Institute recommended adoption of narrative criteria for the Marsh, and offered a detailed suggestion.

EPA believes that the available scientific information points strongly to the need for numeric criteria in the tidal marshes. Nevertheless, EPA does not believe there exists a sufficient scientific basis at this time to support Federal promulgation of numeric criteria for these marshes. EPA is hopeful that the biological studies being prepared at the request of the State Board will be completed soon, and that the State Board will expedite its review of this issue. Given the substantial delays in the completion of these studies, however, EPA does not believe it advisable to delay addressing the serious possibility of adverse impacts to the brackish tidal marshes. For these reasons, EPA is incorporating a narrative criterion applicable to the tidal (i.e., unmanaged) areas of the Suisun Marsh in the final rule.

To be consistent with EPA guidance, narrative criteria should include specific language about conditions that must exist to protect a designated use, and may include specific classes and species of organisms that will occur in waters for a given designation (USEPA 1990). The narrative criterion promulgated below by EPA includes language about important measures of biological integrity specific to Suisun Bay tidal marshes. Specific reference conditions are not included in the criterion; however, it is the intent of this criterion to reflect conditions equalling the level of protection existing in the Suisun Marsh in the late 1960's to early 1970's. As a result of the recent drought and continued high level of freshwater diversion from the estuary, recent conditions have deteriorated in the Suisun Marsh, as indicated by decreased habitat for the Suisun song sparrow and replacement of tules with Spartina foliosa.

In implementing this narrative criterion, the State Board should take care to protect the specific classes and species of organisms that are vulnerable to increasing salinity in the Suisun Marsh. Vulnerable species include those species that are presently listed under the Federal Endangered Species Act, including the salt-marsh harvest mouse (Reithrodontomys raviventris) and the California clapper rail (Rallus longirostris obsoletus). Vulnerable species also include both those rare plants that are candidates for listing under the Federal Endangered Species Act (including Mason's lilaeopsis (Lilaeopsis masonii), delta tule pea (Lathyrus jepsonii), Suisun slough thistle (Cirsium hydrophilum var. hydrophilum), Suisun aster (Aster chilensis var. lentus), soft-haired bird's beak (Cordylanthus mollis ssp mollis)) and dominant plant species such as the tules Scirpus acutus and S. californicus, and the bulrush S. robustus. Animal species include Federal candidate species Suisun song sparrow (Melospiza melodia maxillaris), California black rail (Laterallus jamaicensis coturniculus) tri-colored blackbird (Agelaius tricolor), saltmarsh common yellowthroat (Geothylpis trichos sinuosa), Suisun