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**HABITAT MANAGEMENT FOR MIGRATING  
AND WINTERING WATERFOWL  
IN NORTH AMERICA**

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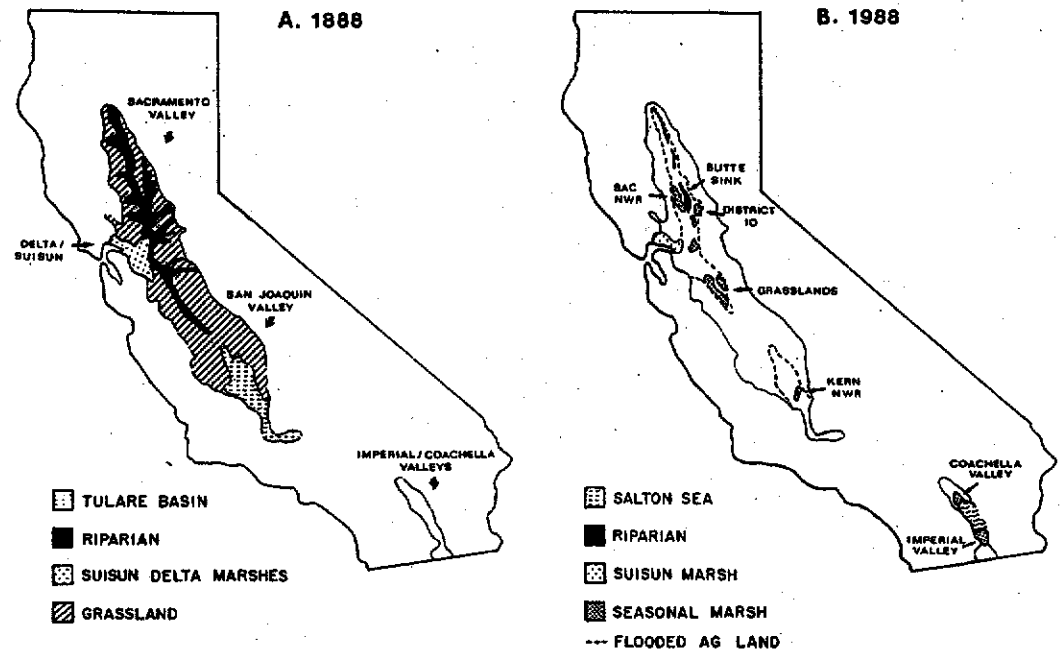


Fig. 1. Valleys of California and the distribution of historic (A) and current (B) wetlands and grasslands. Adapted from Roberts et al. (1977), U.S. Fish and Wildlife Service (1978), Madrone Associates (1980), and Barry (1981).

munities vary regionally and impose different constraints on wetland management. Hence, this paper describes characteristics of, and discusses management activities within, each region separately (i.e., Sacramento Valley, San Joaquin Valley, Sacramento-San Joaquin River Delta and Suisun Marsh, Imperial and Coachella valleys).

### Sacramento Valley

The climate of the Sacramento Valley is typically mediterranean with cool, wet winters and hot, dry summers. Average annual rainfall is 50.8 cm, falling mostly between November and February (U.S. Department of Commerce 1986). Temperatures average 5 C in January and 23 C in July, the coldest and hottest months, respectively. Annually, there are <15 days of below-freezing temperatures.

The Sacramento Valley is drained by the Sacramento River and its tributaries and is bounded by the Klamath Mountain Range to the north, the Sierra Nevada to

the east, and the Coast Range to the west. Peak runoff and discharges down the Sacramento River occur in March (Kahrl 1979). With the exception of the lower reaches of the Mississippi River and certain areas of the Columbia and Ohio rivers, flood waters of the Sacramento River are greater than any other river in the United States (U.S.) (Scott and Marquiss 1984).

Historically, many small creeks and sloughs were braided throughout the Sacramento Valley floor. Some creeks ended in lower depressed "sinks" and did not join the main network of the Sacramento River except during floods (Thompson 1961, Scott and Marquiss 1984). Sedimentation and scouring associated with frequent flooding created mosaics of natural levees, abandoned channels, sinks, lowland swamps, and hummocks over the otherwise relatively flat floodplains (Lapham et al. 1909, Keller 1977, Scott and Marquiss 1984). The extent of these floodplains varied