
A FISHERIES VIEW OF THE DRAIN

by R. Bruce MacFarlane

Discharging saline irrigation water in the Chipps Island area has definite environmental implications. This area already experiences increased salinity resulting from diversions of fresh water to the San Joaquin Valley and Southern California. Further increases in salinity from the drain may significantly impair the biological communities dependent upon this area. This is a critical habitat for oceanic fishes that enter fresh water to breed, particularly striped bass. For example, changing salinity patterns can alter the composition and abundance of prey species resulting in reduced production of striped bass, a fish already suffering substantial decline. Additionally, the effectiveness of man-made marshes in purifying wastewater is in initial stages of testing and is still questionable.

Projections of environmental impact are largely the results of mathematical models. The Delta-Suisun Bay is a highly complex system. Modeling such a system is difficult and in many cases not justified by current knowledge and understanding. Model results must be interpreted with caution and cannot be accepted as definitive. Estimates of concentrations of substances in the drain water vary widely from report to report, casting more doubt on the validity of model forecasts. (Compare, for example, estimates in the Interagency Drainage Program — IDP — report to those in the Draft Supplemental Environmental Impact Statement for the San Luis Unit.) Concentrations alone, without knowledge of the volume of drainage discharge and the rate of flow of receiving waters, are not very useful in assessing likely effects. The IDP report on the San Joaquin Valley Master Drain projects eventual discharges amounting to 22% of the total water flowing into the San Francisco Bay system. If municipal sewage discharges are added in, then 32%

of the "fresh water" entering the Bay will be of degraded quality. This certainly suggests that biological impacts will not be negligible.

Reservations regarding projections of the impact of additional nitrogen are certainly justified, especially in the case of shallows, where potential for explosive growth of algae is high. However, the impact of added heavy metals and pesticides must also be looked at critically. The National Marine Fisheries Services (NMFS) at Tiburon has considerable evidence that present levels are adversely affecting abundance and health of striped bass in the area. Projections of concentrations of heavy metals and pesticides reveal that many will exceed background levels and government standards. IDP's conclusion that the discharge would not be toxic clearly misunderstands the intent of water-quality criteria and disregards the possibility of accumulation of toxins by organisms. These reflect current knowledge of what will protect the health and welfare of aquatic organisms and humans.

Implementation of this drainage plan seems premature. There are too many questionable assumptions and unresolved problems with potentially serious consequences for this alternative to be considered acceptable. The NMFS is on record as favoring evaporation ponds to dispose of saline, subsurface drainage water. The NMFS also favors alternatives that would reduce demand for more surface water for irrigation, thereby reducing salt accumulation in soils. These alternatives would include water-pricing reform, water conservation (including more efficient irrigation techniques), groundwater management, and selection of crops more compatible with environmental conditions, such as higher salt tolerance or lower water requirements.

FOR FURTHER READING

California Water Atlas. State of California. General Services, Publications Section, P.O. Box 1015, North Highlands 95660

Desertification of the United States. Council on Environmental Quality, Washington, D.C.

Federal Charges for Irrigation Projects Reviewed Do Not Cover Costs. General Accounting Office report PAD-81-07.

Final Report. Governor's Commission to Review California Water Rights Law. 1978.

Ground Water Basins in California. Bulletin 118-80, Department of Water Resources, P.O. Box 388, Sacramento 95802.

Layperson's Guide to Ground Water. Western Water Education Foundation, 1107 Ninth St., Suite 618, Sacramento 95814.

Riparian Forests in California. Institute of Ecology, Univ. of California, Davis. Reprinted, 1980, by Agricultural Sciences Publications, Univ. of California, Berkeley, Publ. No. 4101.

Summary Appraisals of the Nation's Ground-Water Resources - California Region. U.S. Geological Survey Prof. Paper 813-E.

Water Conservation in California. Bulletin 198. Department of Water Resources, P.O. Box 388, Sacramento 95802.