Chapter IV

CUMULATIVE IMPACTS

Some of the resources impacted by the proposed project would be impacted by other projects that are proposed or are under construction. The following discussion describes such instances and presents an estimate of the cumulative impacts of all potential projects.

COLORADO RIVER

In addition to the proposed project to line the All-American Canal (AAC), several other proposed projects would have a similar effect on flows between Parker Dam and Imperial Dam. An analysis was made of the cumulative impacts of these potential projects.

Projects Proposed

Proposed projects include Federal and non-Federal actions within California and Arizona. Federal actions include:

- All-American Canal Lining Project
- Coachella Canal Lining Project
- Cliff Dam Water Replacement
- Southern Arizona Water Rights Settlement Act
- Imperial County Groundwater Storage and Recovery
- San Luis Rey Indian Water Rights Settlement Act involving ground-water storage and recovery

Non-Federal actions are phases I and II of the components of Imperial Irrigation District-Metropolitan Water District water conservation program, the first of which is presently being implemented under a 1988 water conservation agreement between Imperial Irrigation District and the Metropolitan Water District of Southern California (MWD).

Under each project, a water agency that diverts water at or near Imperial Dam could reduce its diversion, and some other agency could divert the water from Lake Havasu, behind Parker Dam. At Imperial Dam, water is diverted into the AAC and Gila Main Canal, and some irrigation water is pumped directly from the river upstream from Imperial Dam. At Lake Havasu, water is diverted into MWD's Colorado River Aqueduct and into the Central Arizona Project's Hayden-Rhodes Aqueduct. The water made available by reduced diversions at or near Imperial Dam would enable MWD to compensate for future reductions in available Colorado River water and would enable water agencies in Arizona to obtain additional water (chapter I, "Colorado River Entitlements").

Some of the projects are currently being implemented; others are still in a preliminary planning stage. The aggregate

amount of water involved is estimated to be 480,000 acre-feet per year. The projects would have a long-term effect on future riverflow below Parker Dam.

Assessment of Impacts

An assessment was made of the effects that reducing releases from Parker Dam by 480,000 acre-feet would have on the following resources:

- Riverflow
- Water level of the river
- Riparian and backwater habitat
- Recreation
- Salinity at Imperial Dam

The Colorado River Simulation System[1] was used to estimate future river discharge, salinity, and power production under two conditions—without and with the proposed projects. The "without projects" condition (baseline condition) consists of future river operations with current projections of future diversions from the river. The "with projects" condition consists of the baseline condition with changes resulting from implementation of the projects.

Projected average monthly flow without the projects would be about 10,000 cubic feet per second (ft^3/s). A reduction of river discharge below Parker Dam of 480,000 acre-feet would reduce the average monthly flow below Cibola Lake (a point between Blythe, California, and Imperial Dam) by about 700 ft^3/s in April and August, critical months from a biological standpoint. The reduction in flow would occur gradually over a period of more than a decade. Figure IV-1 shows the future monthly flow at Cibola Lake in a typical future year for the baseline condition without the projects and for the condition with the projects. From April through September, flows with the projects range from 93 percent to 94 percent of flows without the projects.

The water level in the river downstream from Parker Dam fluctuates in a pattern that is set by releases from Parker Dam. Upstream from the Palo Verde Diversion Dam near Blythe, California, the highs and lows are directly influenced by the pattern of releases from Parker Dam, which is high during the day and low at night. Typically, there is a summer fluctuation of 5 feet (winter, 2-1/2 feet) immediately downstream from Parker Dam. This fluctuation gradually attenuates as the river flows downstream. The river water level upstream from Imperial Dam has a daily fluctuation of about one-half foot, superimposed on monthly and yearly fluctuations of several feet.

Results of the analysis indicate that upstream from the Palo Verde Diversion Dam near Blythe, California, the daily fluctuation (highs and lows) would be unaffected in magnitude. The duration of the highs would decrease slightly. Downstream from the Palo Verde Irrigation District, centered near Blythe, implementing all projects would cause, at most, a 4-inch reduction in average water surface elevations when more or less

[1] A detailed computer model of the entire Colorado River System, used regularly to analyze operation of Federal reservoirs and predict river discharge.

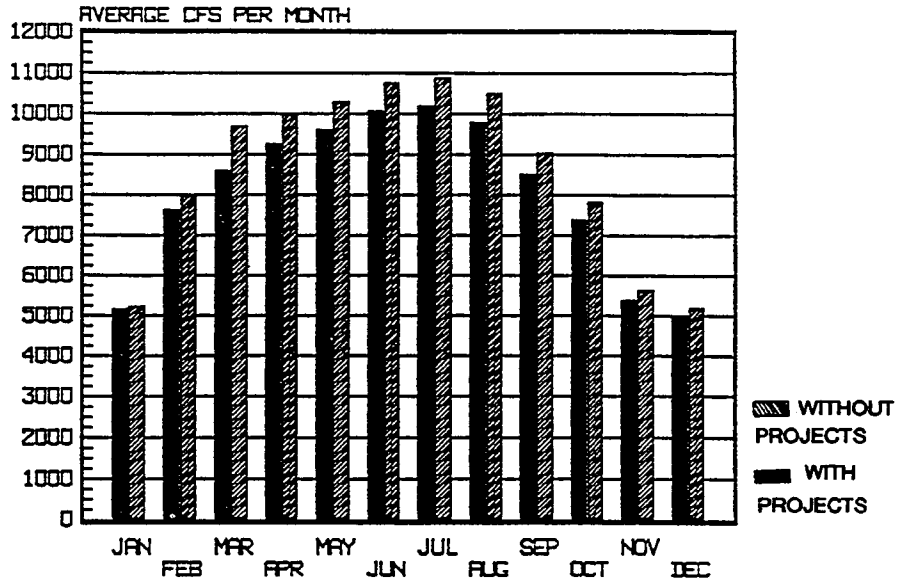

Figure IV-1.—Average monthly flow in 2021, Colorado River at Cibola Lake.

"normal" flows occur in the Imperial Division, area of greatest biological concern. This reduction would occur against the background of continually fluctuating riverflow and water levels, in which the minimum and maximum flows would remain unchanged.

Based on the analysis, it is concluded that:

- The 4-inch reduction in the mean water level during normal flow would reduce the river surface area of the lower river and its adjacent backwaters by 30 acres at most. During normal flow conditions, this would be less than 1 percent of the total.
- Riparian and marsh vegetation would adapt to the minor shift in average bankline.
- Fish spawning would not be impacted.
- Recreation on the Colorado River would not be impacted.
- Flow-weighted average salinity of the Colorado River at Imperial Dam would be increased by approximately 5 milligrams per liter.

HYDROELECTRIC POWER ALONG THE ALL-AMERICAN CANAL

Other water conservation activities in the IID would have an effect on power generation along the AAC similar to that of lining the AAC. The water conservation program presently being implemented jointly by IID and MWD would reduce flow through all four of the powerplants along the AAC. Future water conservation activities also would reduce flow. Table IV-1 presents the approximate power reduction at Drops 1, 2, 3, and 4, based on present estimates of water conserved.

HYDROELECTRIC POWER ALONG THE COLORADO RIVER

Hydroelectric powerplants at Hoover, Davis, and Parker Dams currently generate electric power with water released to meet downstream delivery requirements. It is estimated that in the future without the proposed projects, the future average annual power generation would be 5,936 million kilowatthours per year.

The 480,000-acre-foot reduction in releases from Parker Dam, discussed previously in this chapter, would affect power generation along the Colorado River. The CRSS model studies indicate that reduced releases from Parker Dam, plus upstream changes in river operation caused by the proposed actions, would reduce future average annual combined hydropower generation at Parker, Davis, and Hoover Dams by approximately 36 million kilowatthours per year, or less than 1 percent.

Table IV-1.—Cumulative hydroelectric power reduction along AAC

Project	Water to be conserved (acre-feet)	Approximate reduction in generation (kWh)[1]
Current IID/MWD Phase I Water Conservation Program	106,110	9,000,000
Parallel Canal Alternative (Preferred Alternative)	67,700	220,000
Future IID/MWD Phase II Water Conservation Program	150,000	13,500,000
Total		22,720,000

[1] kWh = kilowatthours.