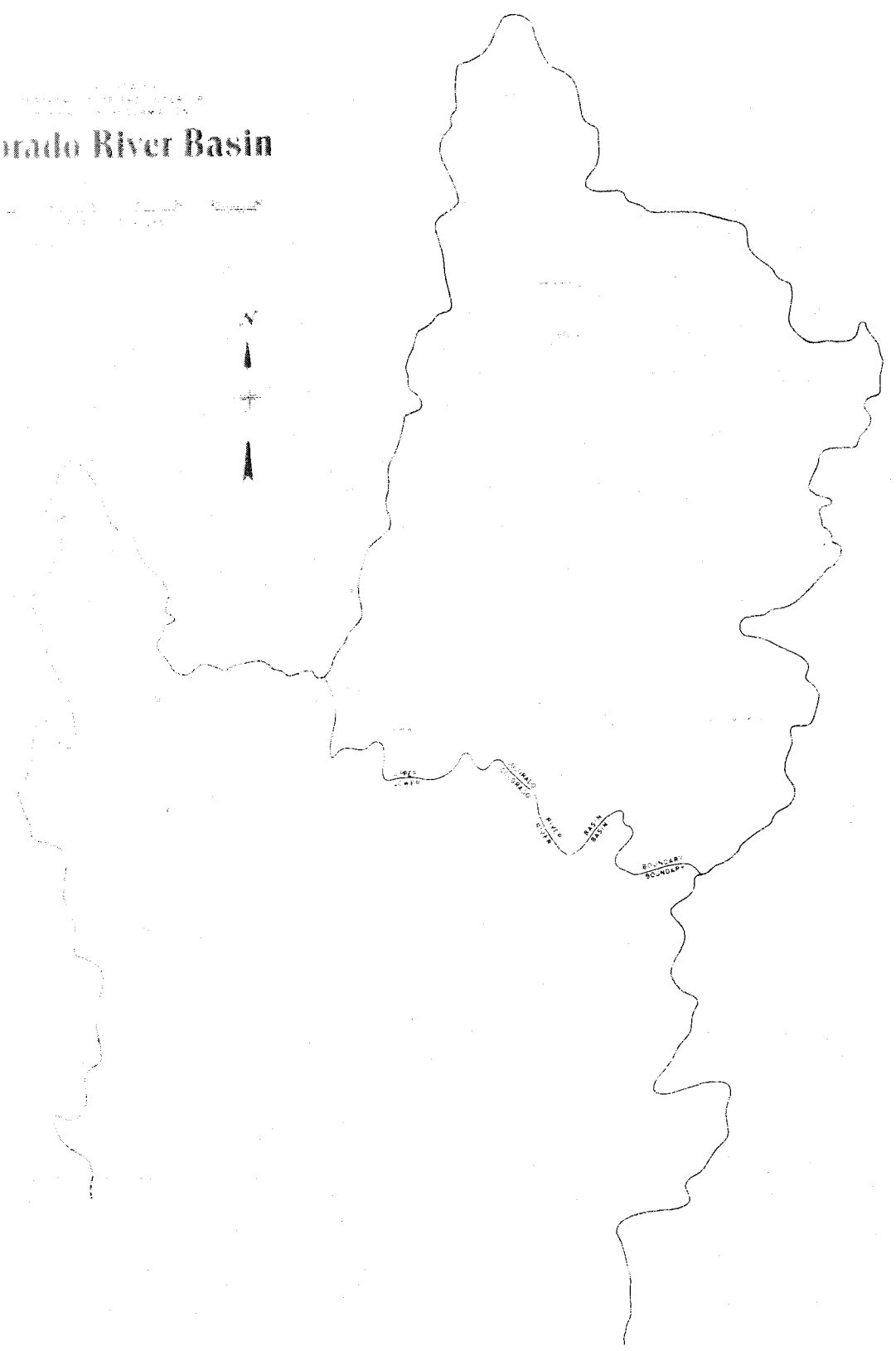


**1972 Operation of the Colorado River Basin
1973 Projected Operations**

UNITED STATES GEOLOGICAL SURVEY
BUREAU OF GEOGRAPHIC NAMES
Colorado River Basin

Scale 1:500,000
1900



ANNUAL REPORT

1972 Operation of the Colorado River Basin

1973 Projected Operations

(prepared pursuant to the Colorado River Basin
Project Act of 1968, Public Law 90-537)

U. S. Department of the Interior
Rogers C. B. Morton, Secretary

Bureau of Reclamation
Ellis L. Armstrong, Commissioner



January 1973

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Curecanti Unit

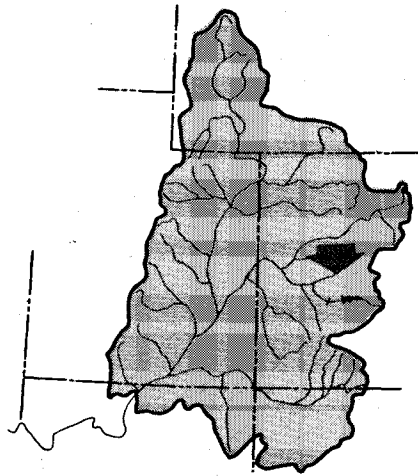


Chart 3/ Blue Mesa Reservoir

STATISTICS		
ACTIVE STORAGE*		
RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	829,523	7519
RATED HEAD	249,395	7438
MINIMUM POWER	81,070	7393
SURFACE AREA (FULL)	9180 ACRES	
RESERVOIR LENGTH (FULL)	24 MILES	
POWER PLANT		
NUMBER OF UNITS	2	
TOTAL CAPACITY OF UNITS	60,000 KILOWATTS	

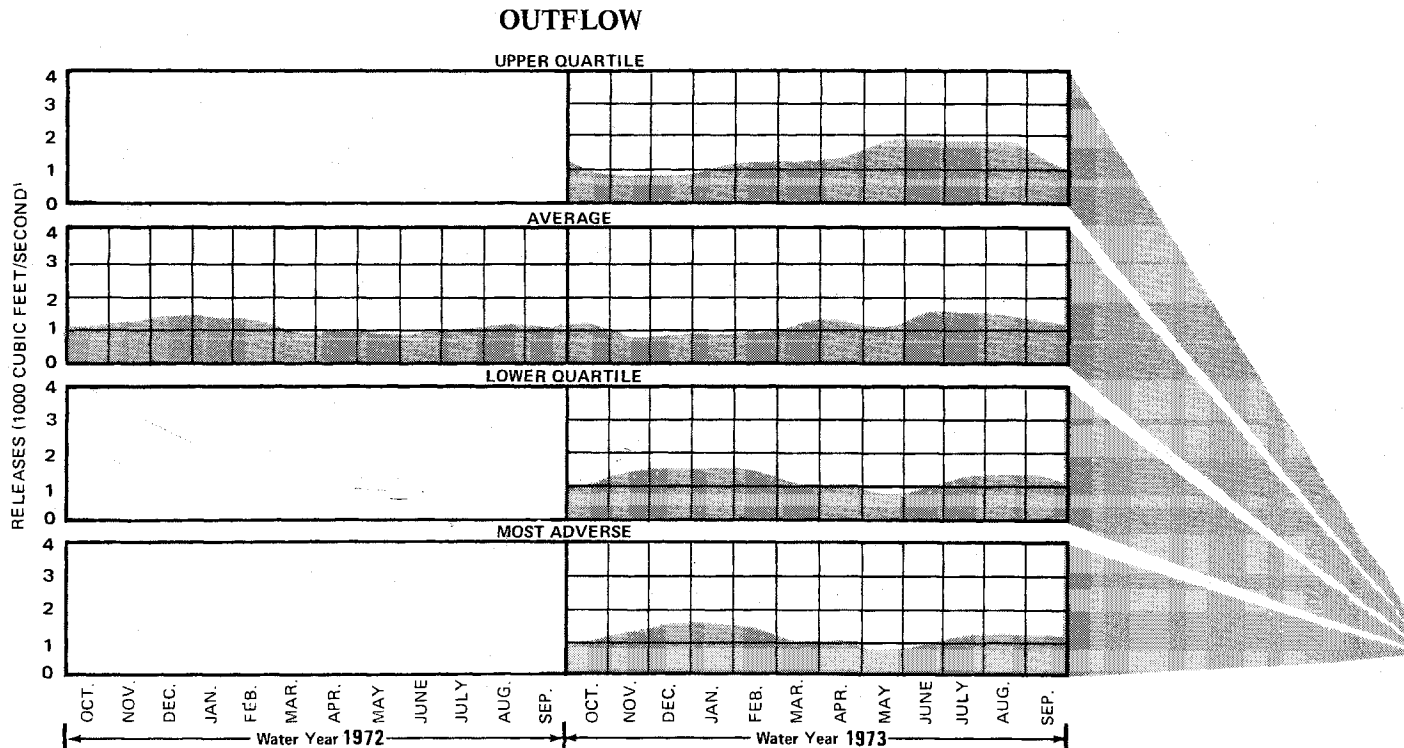
*does not include 111,232 acre feet of dead storage below 7358 feet

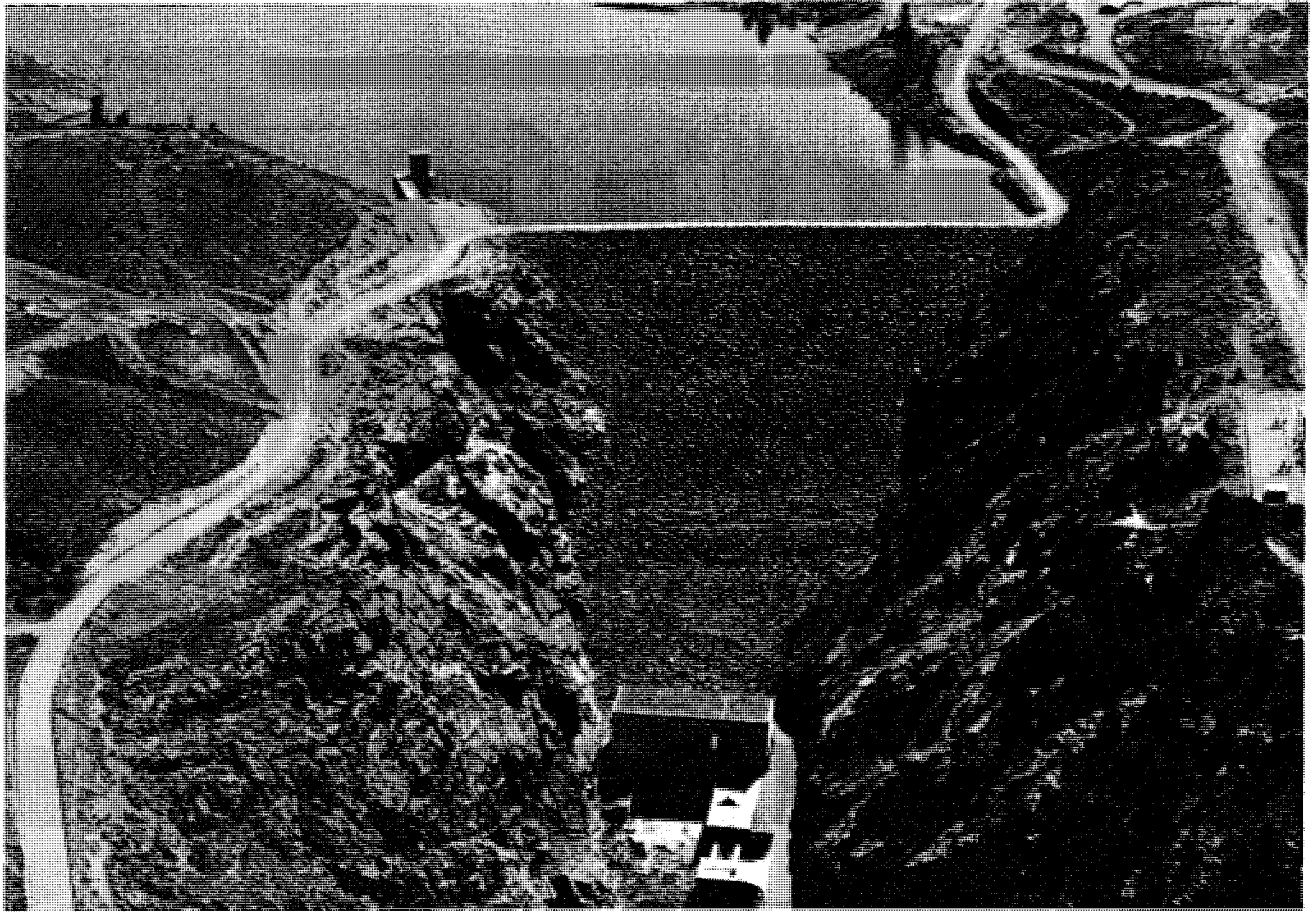
At the end of September 1971, Blue Mesa Reservoir had 532,300 acre-feet of active storage and a water surface elevation of 7,484 feet. During April-July 1972, inflow to Blue Mesa was 469,000 acre-feet, or about 59 percent of the long-time average. This amount of water caused the reservoir to reach a seasonal high of 7,485 feet and an active storage of 543,300 acre-feet early in July. During water year 1972, fishing was enhanced below Gunnison Tunnel by the flow of not less than 300 c.f.s.

A preliminary flood control diagram for Blue Mesa is being used to plan and monitor the routing of the snowmelt runoff. Blue Mesa had an active storage of 321,100 acre-feet on March 1, 1972.

The March 1, 1972, forecast of the April-July 1972 inflow to Blue Mesa was 640,000 acre-feet. The flood control diagram showed that the reservoir could have remained full the remainder of the snowmelt season; therefore, the operation of Blue Mesa did not include releases for flood control. (Chart 3)

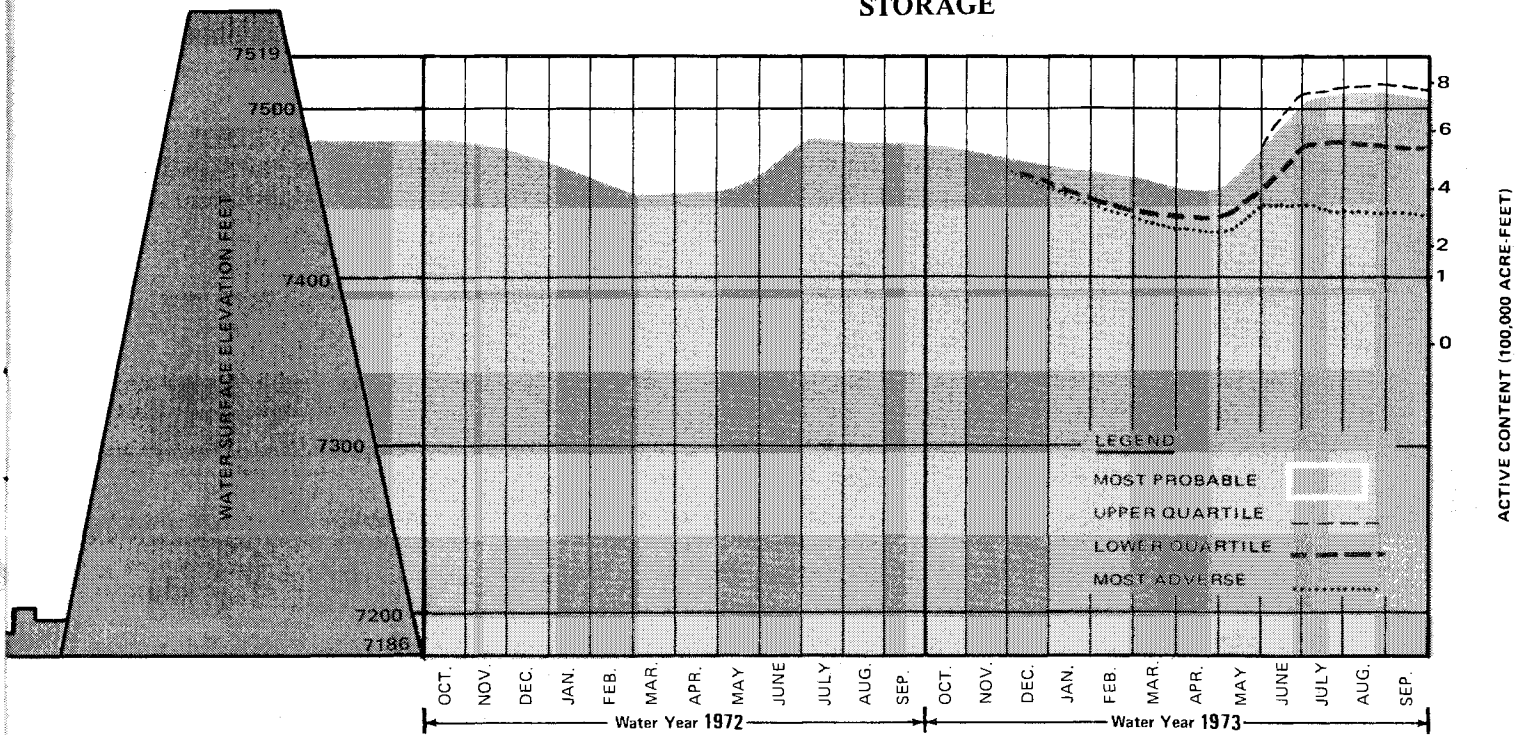
Some ice jamming and overflow occurred along the Gunnison River above Blue Mesa Reservoir during the last 2 or 3 years. Data are being evaluated to determine the effectiveness of the channel improvement program of the Corps of Engineers to alleviate ice jamming above the reservoir.





Blue Mesa Dam and Reservoir, Curecanti Unit, Colorado River Storage Project, Colorado

STORAGE



Curecanti Unit

Morrow Point Reservoir was essentially full during water year 1972. On September 30, 1972, the reservoir contained 116,100 acre-feet of active storage at elevation 7,159 feet. Its inflow is extensively controlled by the larger Blue Mesa Reservoir which is upstream.

Morrow Point Reservoir will normally be operated at or near full capacity regardless of the amount of snowmelt runoff. (Chart 4)

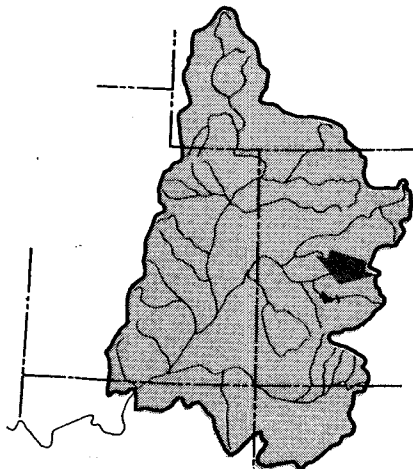


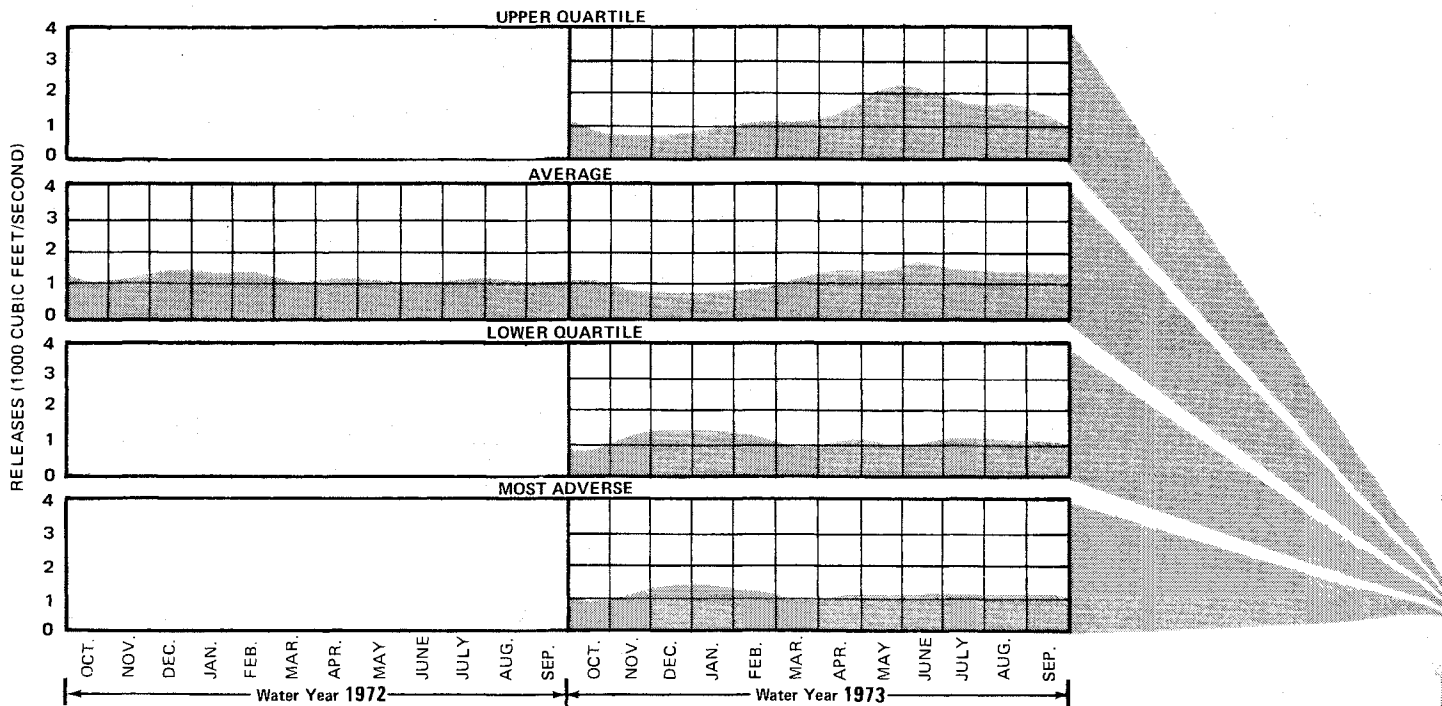
Chart 4 / Morrow Point Reservoir

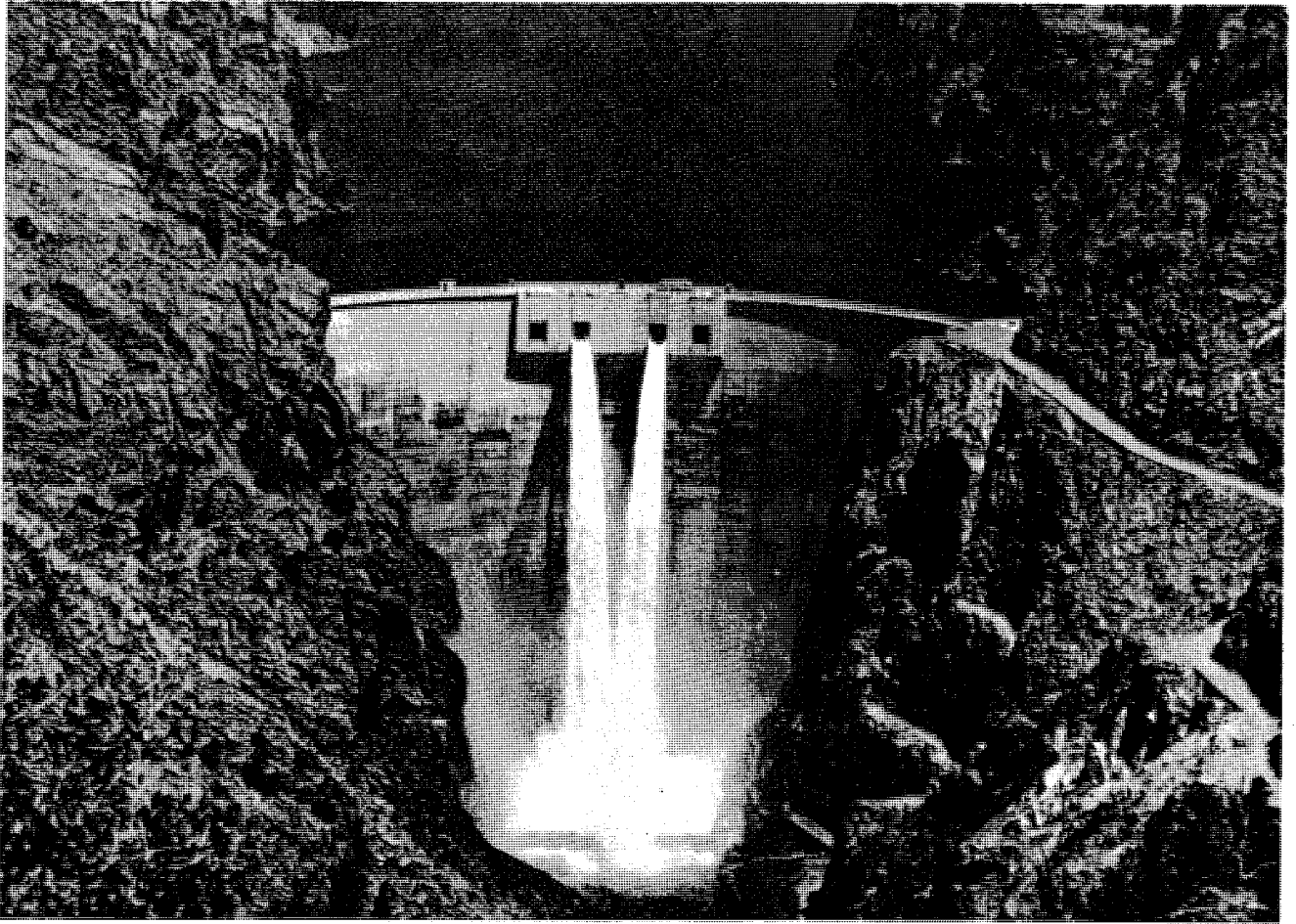
STATISTICS

RESERVOIR	ACTIVE STORAGE* (ACRE-FEET) ELEVATION (FEET)	
MAXIMUM STORAGE	117,025	7160
RATED HEAD	79,805	7108
MINIMUM POWER	74,905	7100
SURFACE AREA (FULL)	817 ACRES	
RESERVOIR LENGTH (FULL)	11 MILES	
POWER PLANT		
NUMBER OF UNITS	2	
TOTAL CAPACITY OF UNITS	120,000 KILOWATTS	

*does not include the 165 acre feet of dead storage below 6808 feet

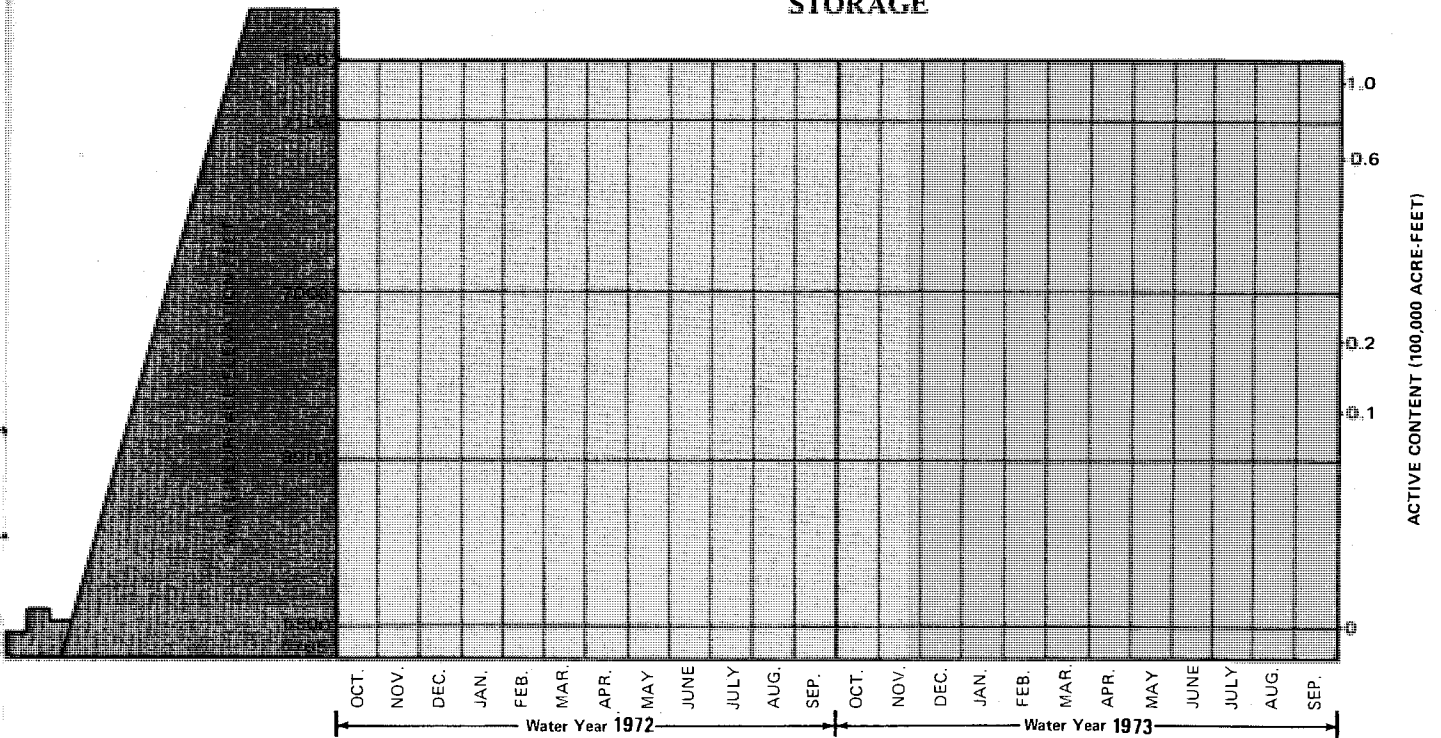
OUTFLOW





Morrow Point Dam and Reservoir, Curecanti Unit, Colorado River Storage Project, Colorado

STORAGE



Navajo Reservoir

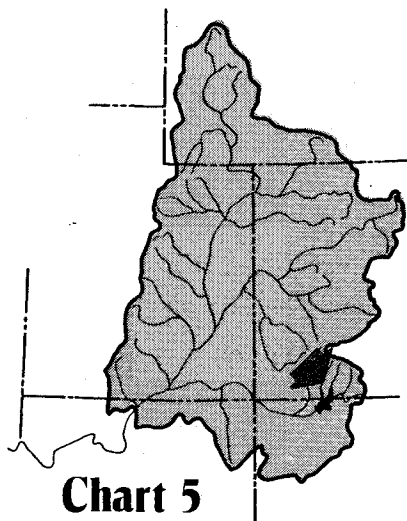


Chart 5

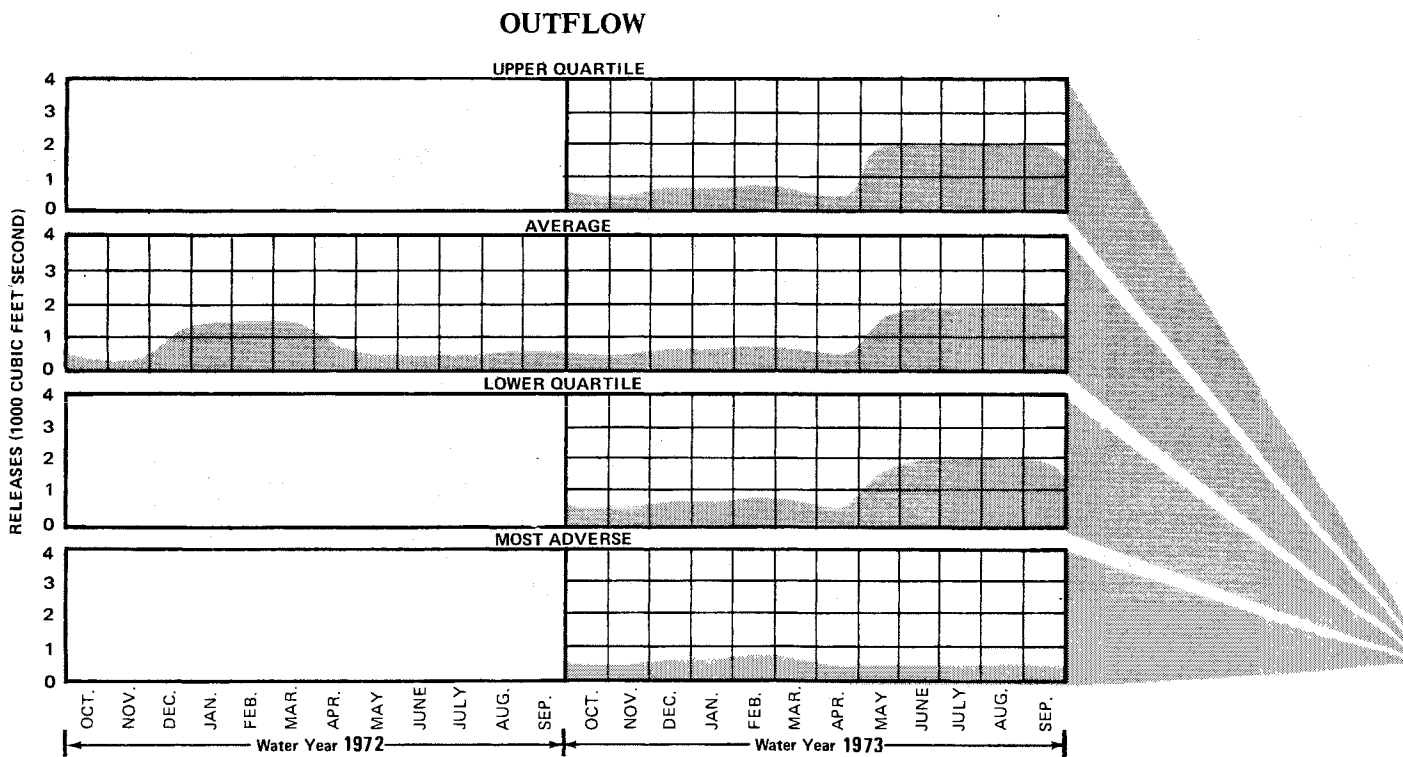
STATISTICS

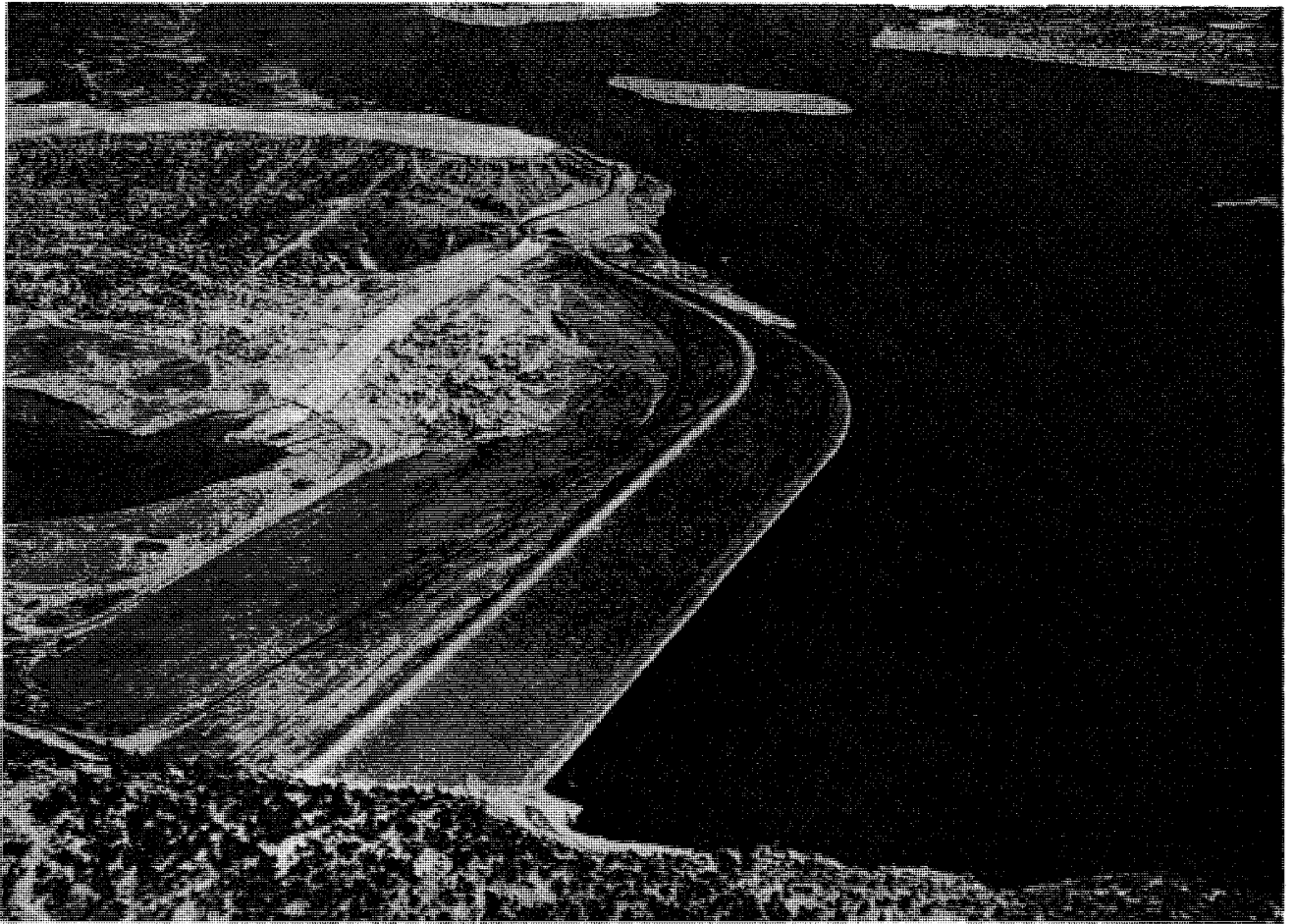
RESERVOIR	ACTIVE STORAGE* (ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	1,696,400	6085
INACTIVE STORAGE	660,500	5990
SURFACE AREA (FULL)	15,610 ACRES	
RESERVOIR LENGTH (FULL)	33 MILES	

*does not include 12,600 acre feet of dead storage below elevation 5775 feet

During water year 1972 Navajo Reservoir was kept within the limits specified by the Bureau of Reclamation in its interim operating rules. The reservoir was lowered to elevation 6,010 feet during the winter of 1971 and spring of 1972. During the spring runoff storage was accumulated as rapidly as possible with releases for downstream uses of 500 c.f.s. The actual April-July inflow to Navajo Reservoir was 259,000 acre-feet or 31 percent of the long-time April-July runoff average above Navajo. The reservoir reached a seasonal high of elevation 6,024 feet with an active storage of 950,000 acre-feet. It was held at or near this elevation during the summer months for recreational purposes by continuing a release of 500 c.f.s.

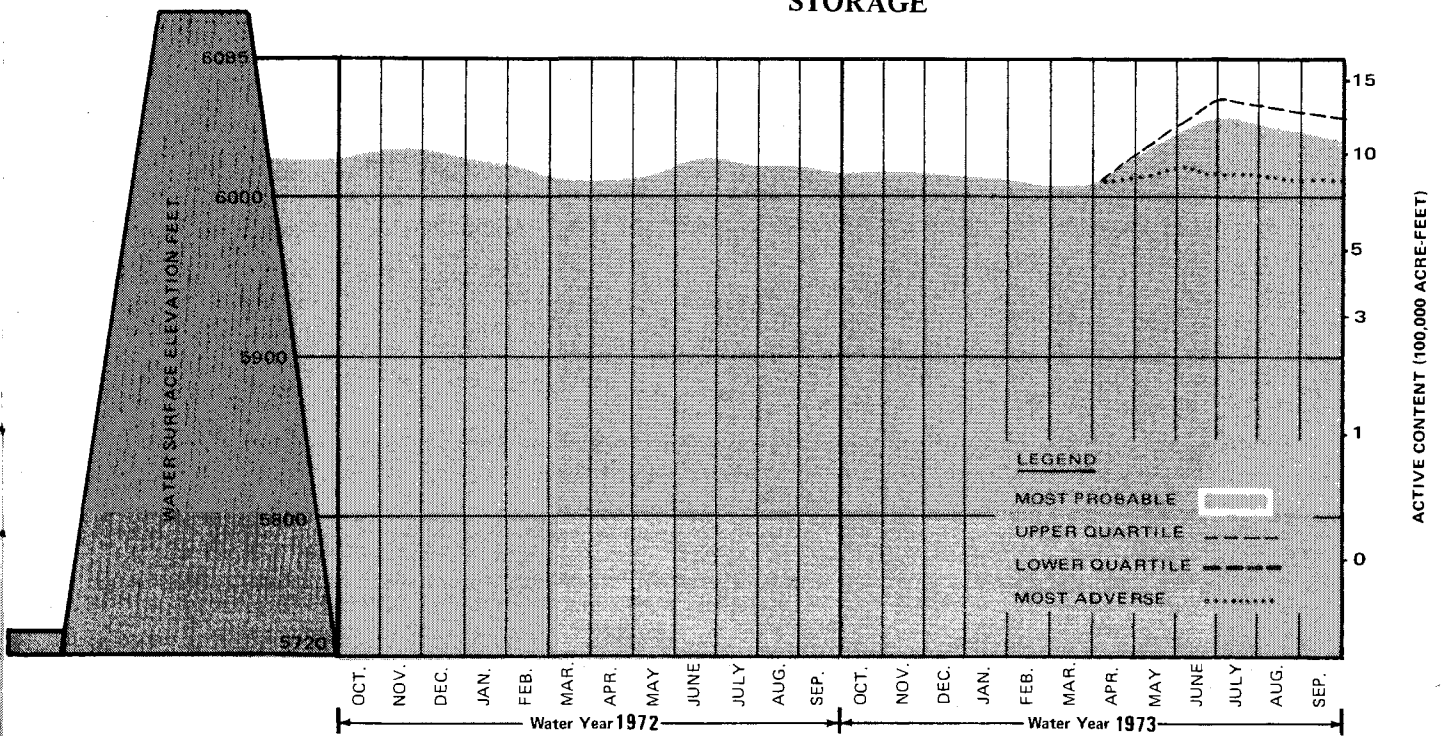
Navajo Reservoir is operated under a formal flood control plan. On March 1, 1972, Navajo Reservoir had 875,100 acre-feet of storage. The April-July inflow forecast on March 1 was 700,000 acre-feet. The current flood control diagram allowed the reservoir to be full with an active storage of 1,696,400 acre-feet during the entire 1972 snowmelt runoff season. Therefore, the scheduled operation of the reservoir did not include any releases for flood control. (Chart 5)





Navajo Dam and Reservoir, Navajo Unit, Colorado River Storage Project, New Mexico-Colorado

STORAGE



Glen Canyon Dam Lake Powell

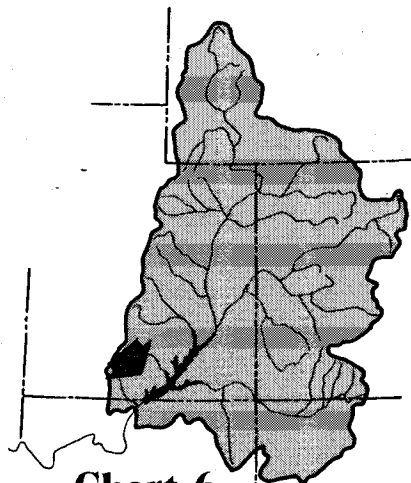


Chart 6

STATISTICS

RESERVOIR	ACTIVE STORAGE*	ELEVATION (FEET)
	(ACRE-FEET)	
MAXIMUM STORAGE	25,002,000	3700
RATED HEAD	9,428,000	3570
MINIMUM POWER	4,126,000	3490
SURFACE AREA (FULL)	161,390 ACRES	
RESERVOIR LENGTH (FULL)	186 MILES	
POWER PLANT		
NUMBER OF UNITS	8	
TOTAL CAPACITY OF UNITS	900,000 KILOWATTS	

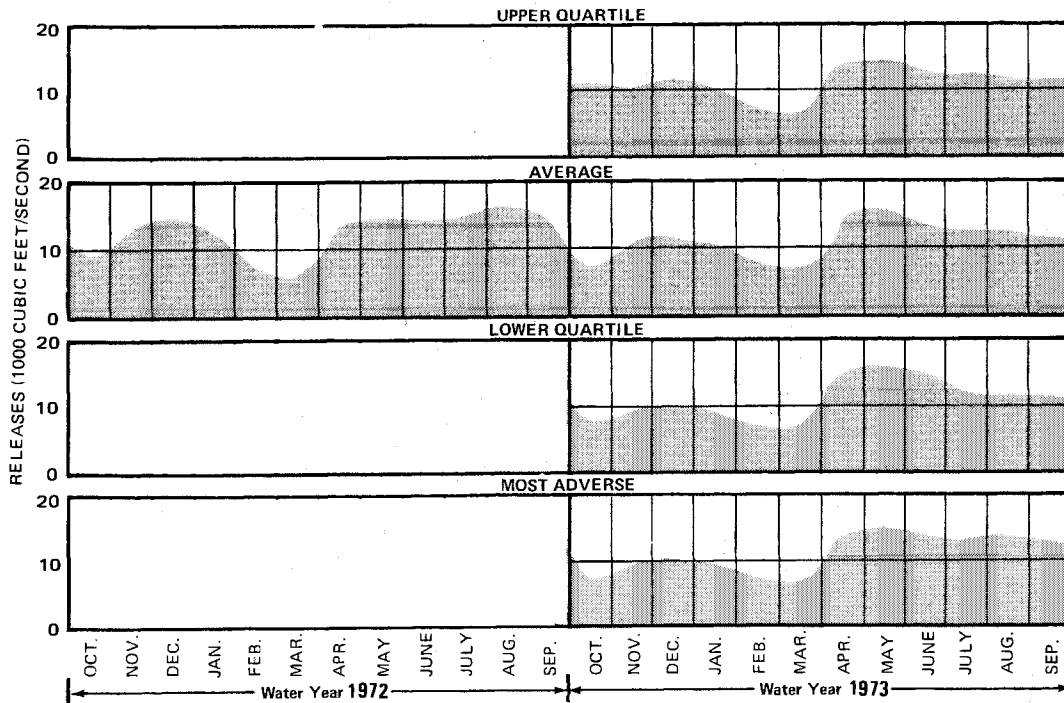
*does not include 1,998,000 acre feet of dead storage below 3370 feet

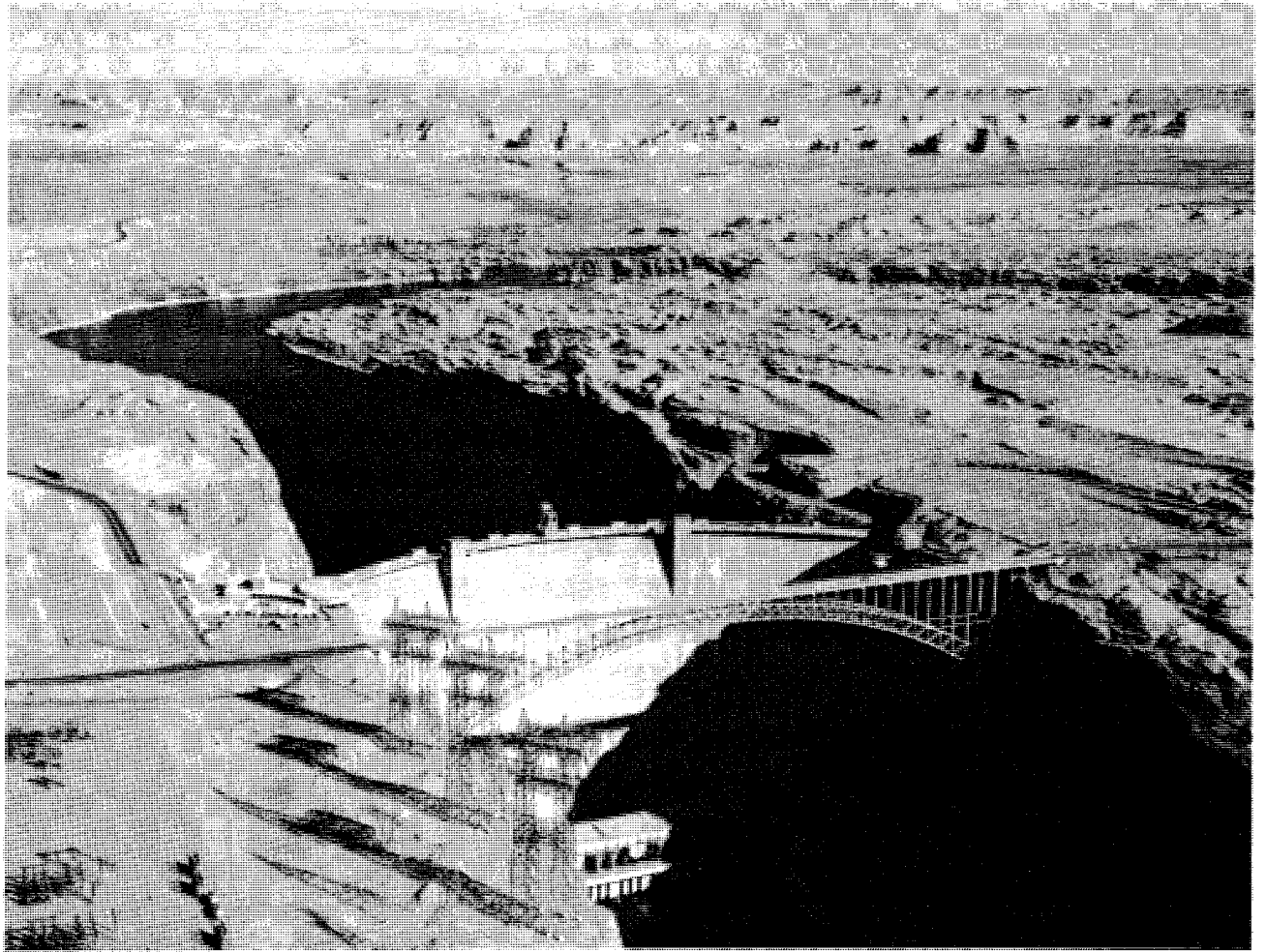
Lake Powell has been operated as part of the Colorado River Storage Project in accordance with governing compacts and laws to provide optimum power production, recreation opportunities, and fish and wildlife benefits. One of the important functions of the reservoir is to provide water from storage to meet the delivery of 75,000,000 acre-feet to the Lower Basin each 10 years as required by the Colorado River Compact. A total of 9,310,000 acre-feet was released from Lake Powell during water year 1972, with 9,330,000 acre-feet passing the Compact point at Lee Ferry, Arizona. Releases from Lake Powell during the year were scheduled so that Lake Mead remained at a near-constant level during the bass spawning season to provide good habitat for propagation.

On September 30, 1971, Lake Powell had an elevation of 3,614 feet and an active storage of 13,609,000 acre-feet. The high water elevation occurred on June 27, 1972, when the reservoir had 14,198,000 acre-feet of active storage at elevation 3,620 feet. This is about 2 feet lower than the all-time high that occurred last year.

The April-July 1971 runoff above the gage at Lees Ferry, Arizona, undepleted by CRSP reservoirs, was 5.6 million acre-feet or 68 percent of the 1906-68 average. On September 30, 1972, the lake had receded 17 feet to elevation 3,603 feet and had an active storage of 12,488,000 acre-feet. (Chart 6).

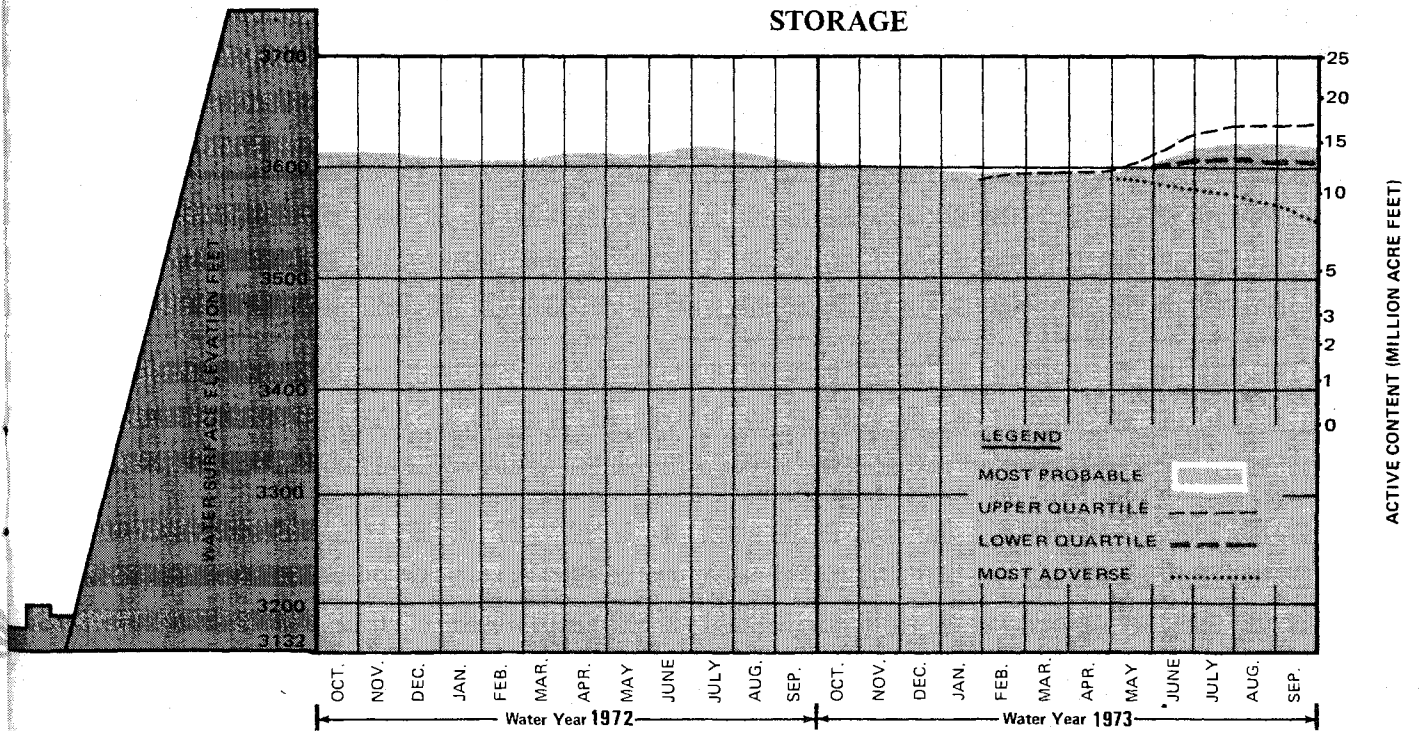
OUTFLOW





Glen Canyon Dam and Lake Powell. Glen Canyon Unit, Colorado River Storage Project, Arizona-Utah

STORAGE



Lower Basin Reservoirs

Hoover Dam Lake Mead

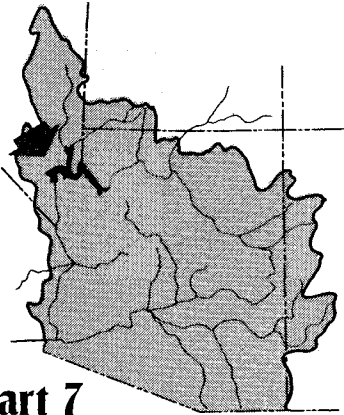


Chart 7

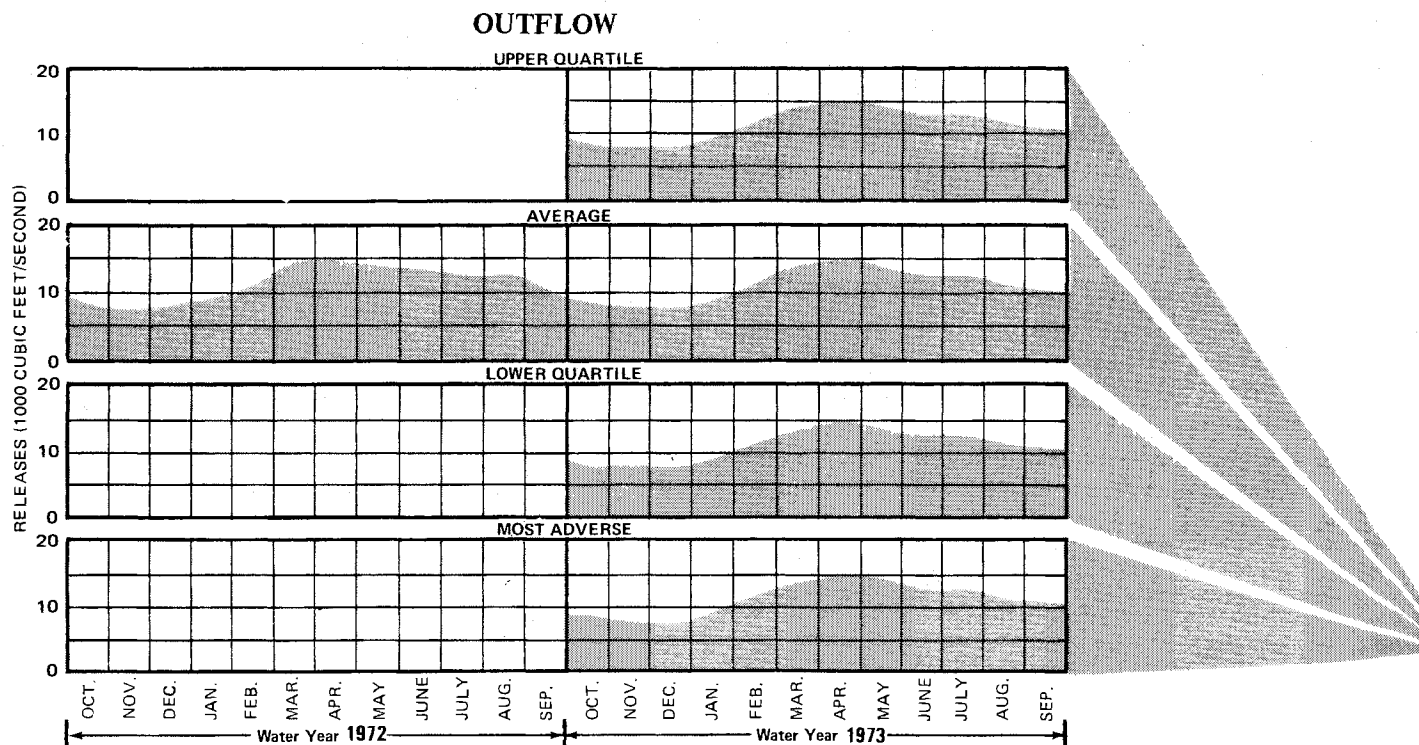
STATISTICS		
ACTIVE STORAGE*		
RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	27,377,000	1229
RATED HEAD	13,653,000	1123
MINIMUM POWER POOL	10,024,000	1083
SURFACE AREA (FULL)	162,700 ACRES	
RESERVOIR LENGTH (FULL)	115 MILES	
POWER PLANT		
NUMBER OF UNITS	17	
TOTAL CAPACITY OF UNITS	1,344,800 KILOWATTS	

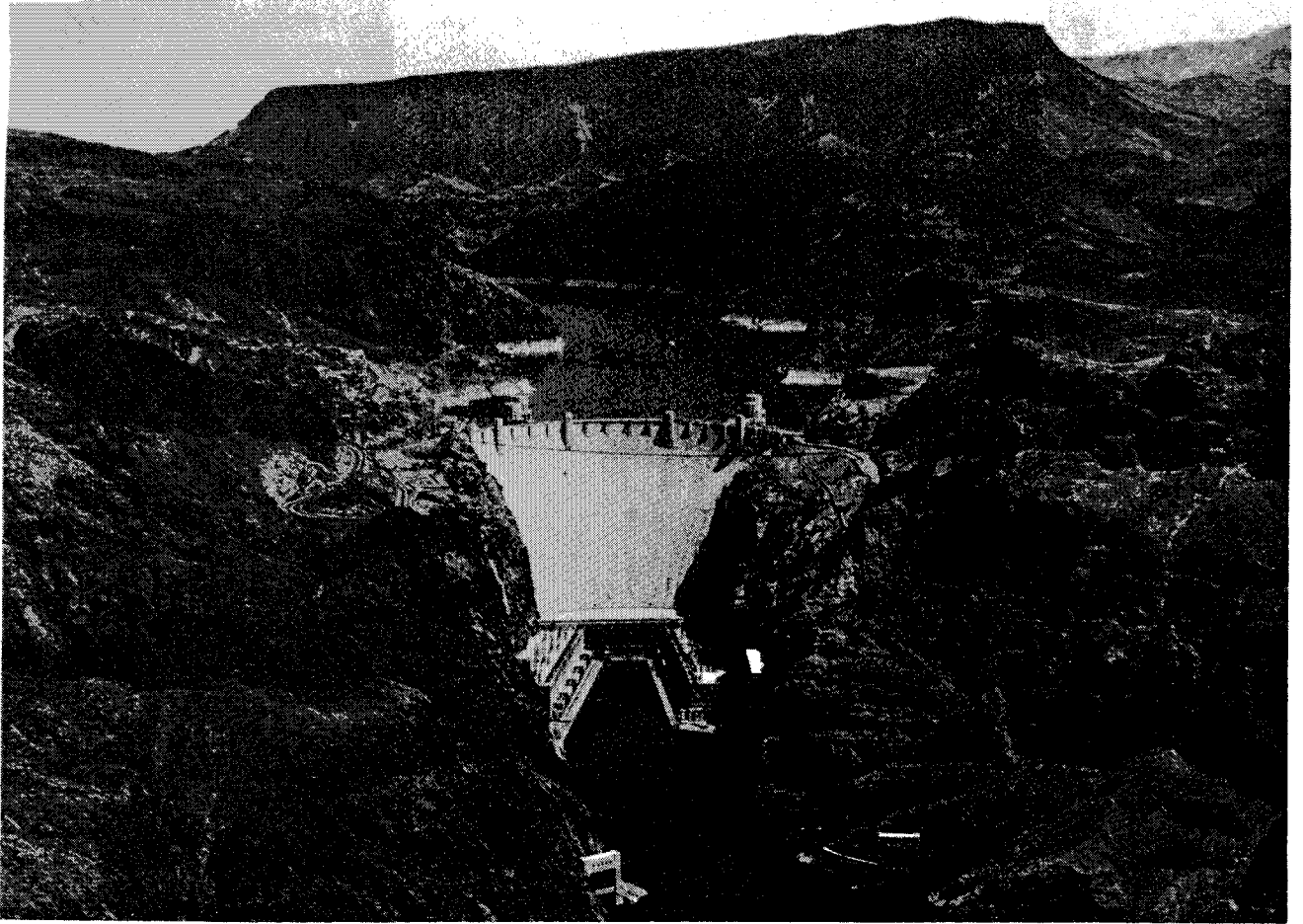
*does not include 2,378,000 acre-feet of dead storage below elevation 895 feet

Lake Mead at the beginning of water year 1972 had a water surface level of 1,154 feet and an active storage of 16,886,000 acre-feet. During the water year releases were made to meet downstream water use requirements in the United States and Mexico, programed levels of Lakes Mohave and Havasu, and transit losses which included river and reservoir evaporation, uses by phreatophytes, changes in bank storage, unmeasured inflows and diversions, etc. The total release from Lake Mead through Hoover Dam was 8,268,000 acre-feet. At the end of the water year, Lake Mead had a water surface elevation of 1,158 feet and an active storage of 17,451,000 acre-feet, which reflect an increase in storage during the water year of 565,000 acre-feet.

Lake Mead is the only reservoir on the Colorado River in which a specified space is allocated exclusively for mainstream flood control. Flood control regulations have been published which take into account effective space in CRSP reservoirs as well as in Lake Mead.

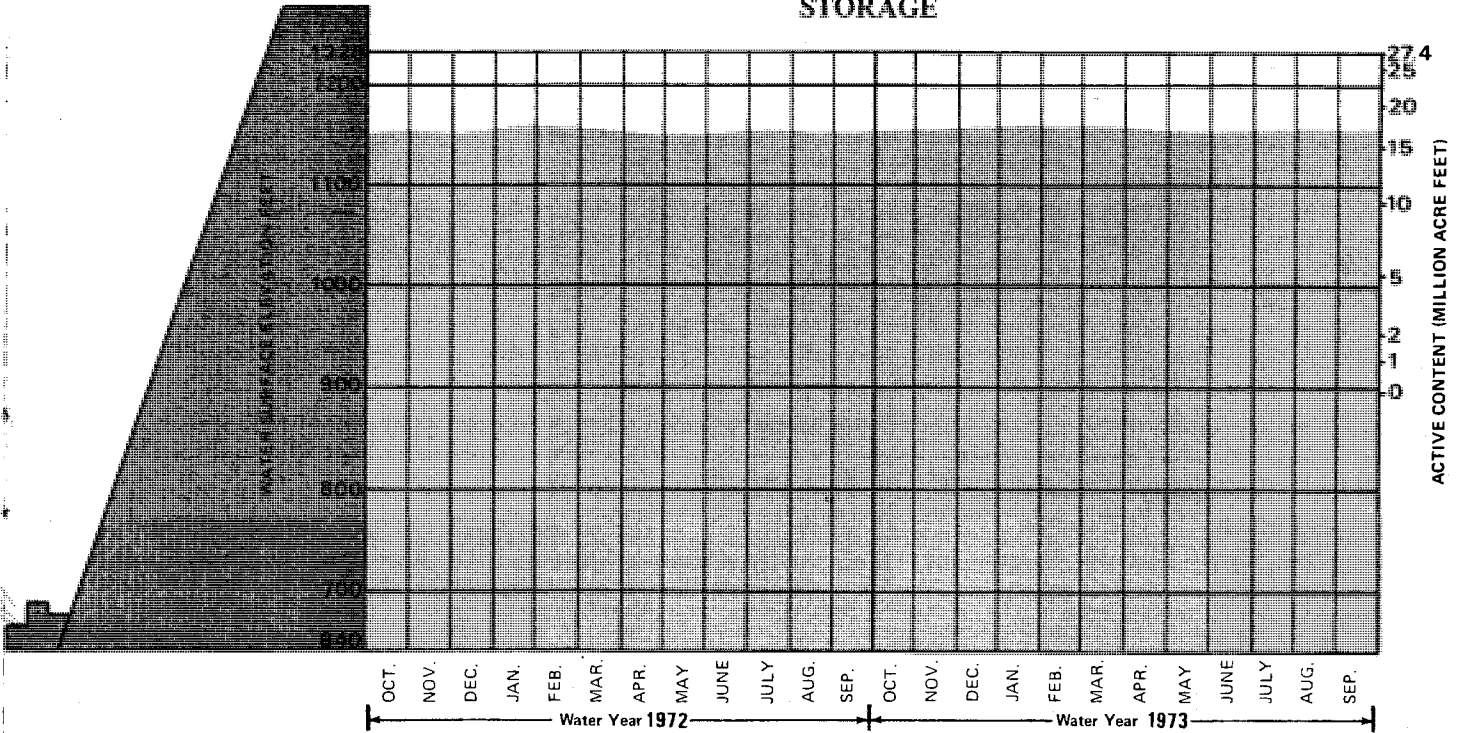
Space in Lake Mead and CRSP reservoirs during water year 1972 was such that no unusual Hoover releases were required to operate pursuant to provisions of the flood control regulations. (Chart 7)





Hoover Dam and Lake Mead, Boulder Canyon Project, Arizona-Nevada

STORAGE



Davis Dam Lake Mohave

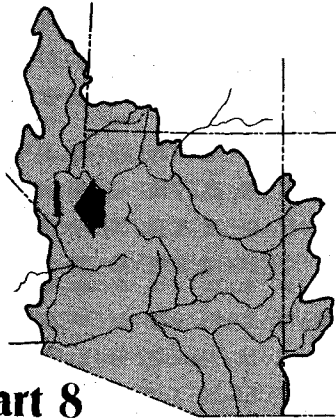


Chart 8

At the beginning of water year 1972, the level of Lake Mohave was 633 feet with an active storage of 1,441,000 acre-feet, about a foot above the minimum storage during the year. During the winter months the level was raised to about 642 feet by the end of February and maintained between that level and 643 feet through April. The high level of Lake Mohave was 645 feet with an active storage of 1,750,000 acre-feet on June 2 which is about the beginning of the heavy irrigation season. The level was drawn down during the summer months to elevation 632 feet with an active storage of 1,404,000 acre-feet at the end of the water year.

Releases from Lake Mohave were made monthly to satisfy downstream requirements with a small amount of reregulation by Lake Havasu. There were 8,455,000 acre-feet released at Davis Dam during the water year, all of which was passed through the turbines for power production. (Chart 8)

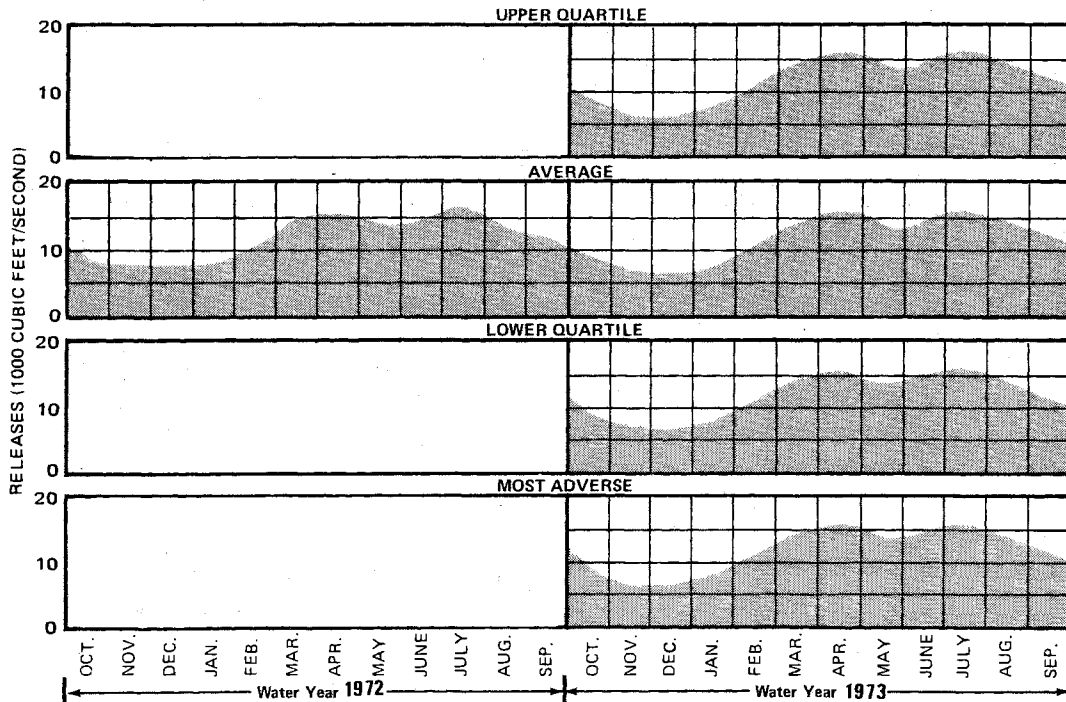
STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	1,810,000	647.0
RATED HEAD	1,188,000	623.0
MINIMUM POWER	217,500	570.0
SURFACE AREA (FULL)	28,200 ACRES	
RESERVOIR LENGTH (FULL)	6.7 MILES	

POWER PLANT	
NUMBER OF UNITS	5
TOTAL CAPACITY OF UNITS	225,000 KILOWATTS

*does not include 8,530 acre-feet of dead storage below elevation 533.39 feet

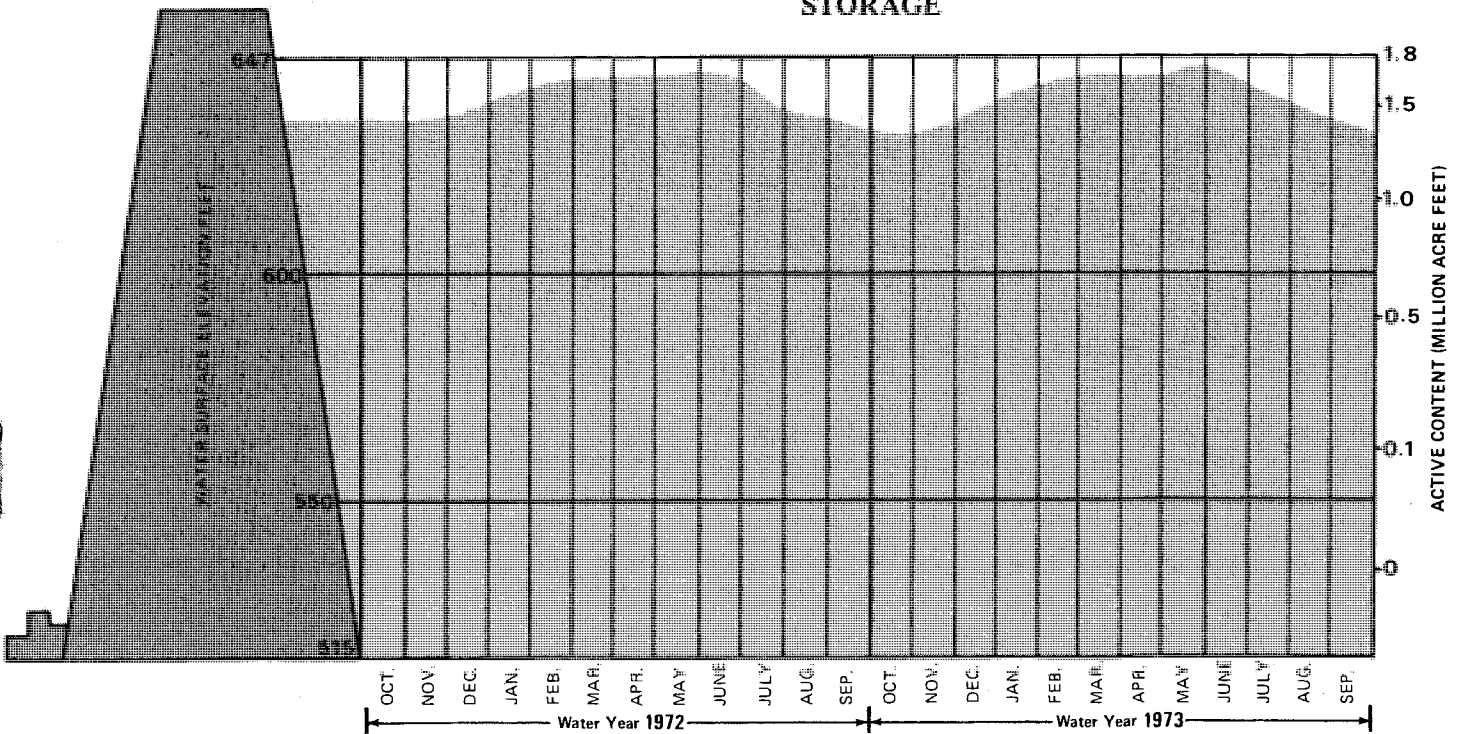
OUTFLOW





Davis Dam and Lake Mohave, Parker-Davis Project, Arizona-Nevada

STORAGE



Parker Dam Lake Havasu

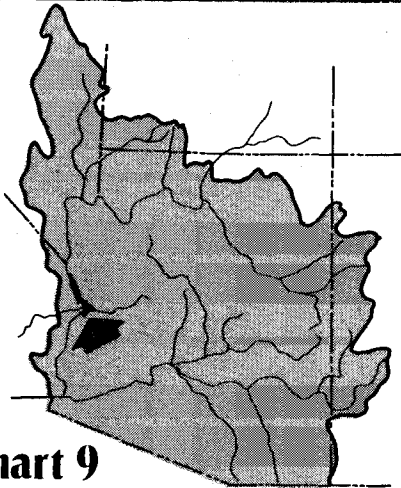


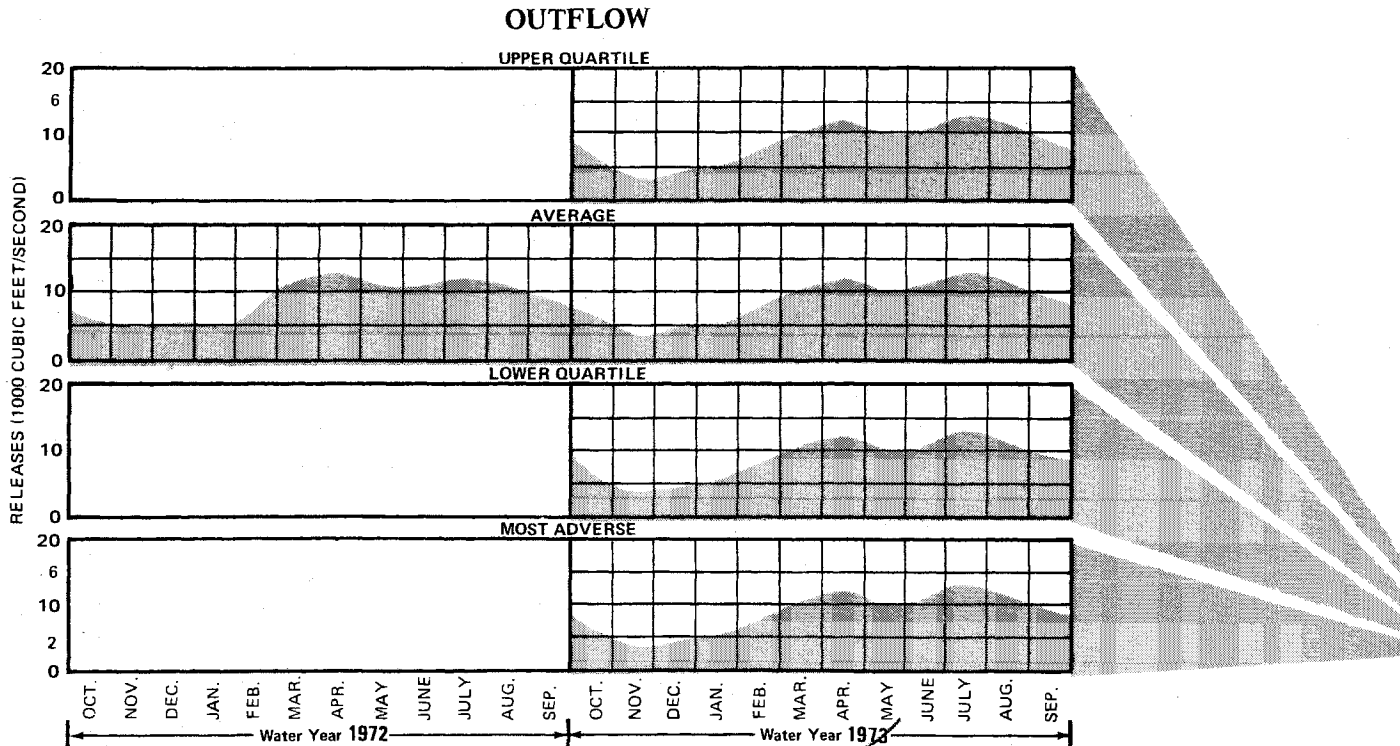
Chart 9

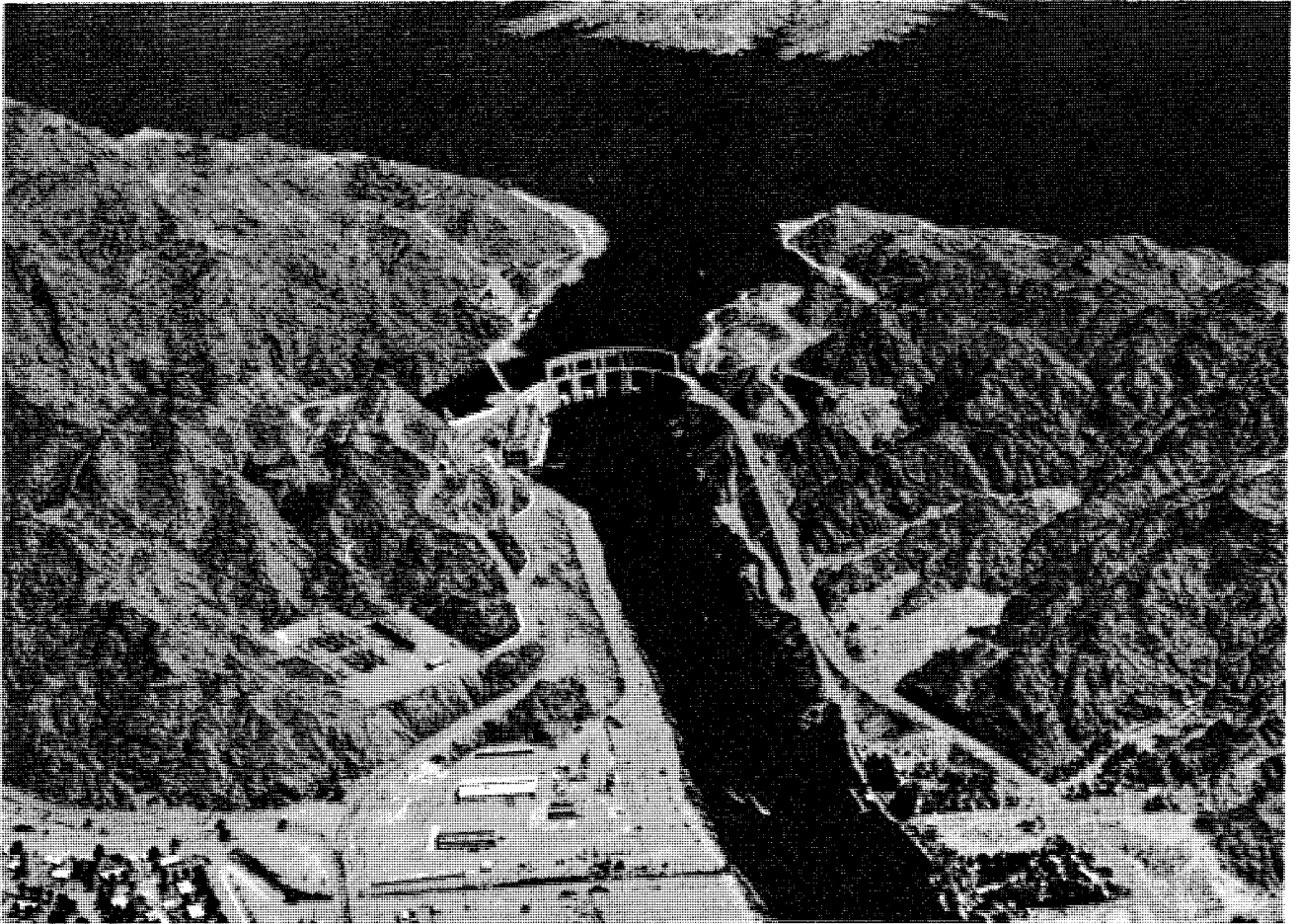
STATISTICS		
RESERVOIR	ACTIVE STORAGE*	ELEVATION (FEET)
MAXIMUM STORAGE	619,400	450.0
RATED HEAD	619,400	450.0
MINIMUM POWER	439,400	440.0
SURFACE AREA (FULL)	20,400 ACRES	
RESERVOIR LENGTH (FULL)	35 MILES	
POWER PLANT		
NUMBER OF UNITS	4	
TOTAL CAPACITY OF UNITS	120,000 KILOWATTS	

*does not include 28,600 acre-feet of dead storage below elevation 400.0 feet

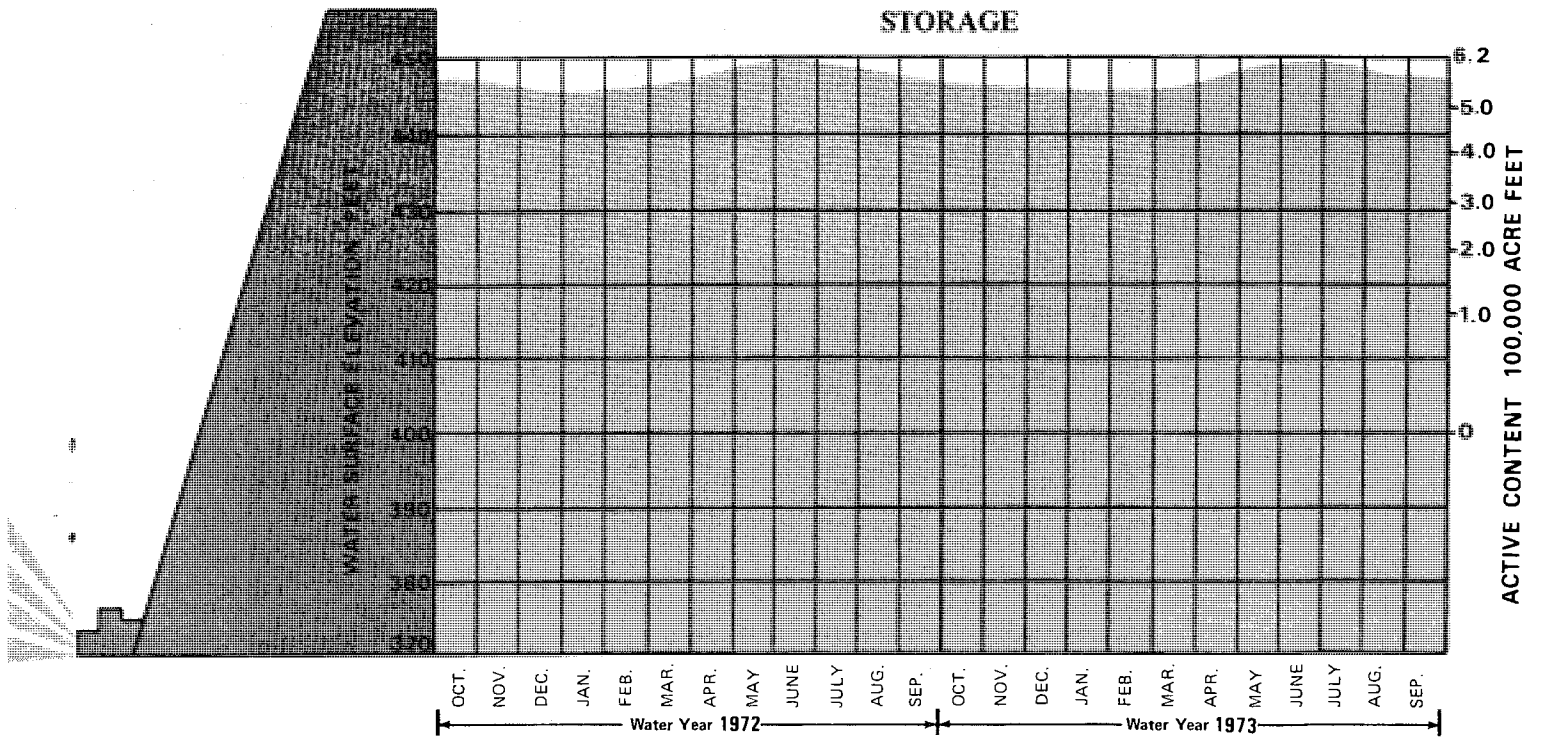
At the beginning of water year 1972, the level of Lake Havasu was 448 feet with an active storage of 571,600 acre-feet. The level was drawn down to about elevation 446 feet with an active storage of about 535,900 acre-feet on December 16, 1971, and remained near that level through March 15, 1972, to provide flood control space for runoff from the drainage area between Davis and Parker Dams. The level was then raised to near full condition by mid-May. During the May 15 through June 30 period the level was maintained near maximum with an active storage of about 605,000 acre-feet and then was drawn down to 447 feet with an active storage of 560,200 acre-feet by the end of the water year. There were 6,945,000 acre-feet released at Parker Dam during the water year, all of which was passed through the turbines for power production.

Joint use space in the top 10 feet of Lake Havasu (about 180,000 acre-feet) is reserved by the United States for control of floods and other uses including river regulation. Now that Alamo Reservoir on the Bill Williams River is in operation, only about the top 4 feet or about 77,000 acre-feet of space is normally used for this purpose. (Chart 9)





Parker Dam and Lake Havasu, Parker-Davis Project, Arizona-California





Colorado River below Davis Dam, Arizona-Nevada

River Regulation

Water release from Glen Canyon Reservoir during water year 1972 was 9,310,000 acre-feet as measured at the Lees Ferry gaging station. The water passing the Compact point at Lee Ferry totaled 9,330,000 acre-feet and 75,309,000 acre-feet for the 1-year and 10-year periods ending September 30, 1972, respectively. The annual release of 8,230,000 acre-feet from Lake Powell scheduled for the current year when added to the flow of the Paria River will result in Upper Basin delivery of about 81 million acre-feet for the 10-year period ending September 30, 1973.

Water release schedules for the Colorado River Storage Project and Participating Project reservoirs were planned to accommodate all of the multiple purposes for which the project was designed plus many day-to-day demands that developed throughout the year.

Daily releases are normally made from the storage reservoirs in the Lower Basin to meet the daily orders of the water user agencies and all water passes through the turbines. The daily releases are regulated on an hourly basis to meet

as nearly as possible the powerloads of the electric power customers. Minimum daily flows are provided in the river to maintain fishery habitat. Adjustments to the normal releases are made when possible to provide for more satisfactory conditions for water-oriented recreation activities, to provide transport for riverborne sediment to desilting facilities, and to provide a degree of control of water quality.

River regulation below Hoover Dam was accomplished in a manner which resulted in delivery to Mexico of 84,942 acre-feet in excess of minimum Treaty requirements during water year 1972. There were 54,339 acre-feet and 25,043 acre-feet of this quantity which were delivered pursuant to provisions of Minutes 218 and 241 of the Mexican Treaty, respectively. The remaining 5,560 acre-feet were regulatory waste.

Beneficial Consumptive Use

UPPER BASIN USES

The three largest categories of depletion in the Upper Basin are agricultural use within the drainage basin, diversions for all purposes to adjacent drainage basins, and evaporation losses from all reservoirs.

During water year 1972, agriculture and M&I uses in the Upper Basin are estimated to have been less than 2,000,000 acre-feet due to sub-normal runoff above points of diversion in the San Juan and parts of the mainstem Colorado River drainage areas. About 600,000 acre-feet were diverted to adjacent drainage basins and 495,000 acre-feet were evaporated from mainstem reservoirs in the Upper Basin. An additional 150,000 acre-feet are estimated as evaporation from other reservoirs and stockponds in the Upper Colorado Basin.

Water is being stored in the Upper Basin reservoirs and will be released to the Lower Basin as specified by Section 602(a) of Public Law 90-537 and the laws, compacts, and treaties upon which Section 602(a) is based.

LOWER BASIN USES AND LOSSES

Releases of 6,945,000 acre-feet from Lake Havasu during water year 1972 were made to meet the requirements for water deliveries at Imperial Dam as well as those of the Colorado River Indian Reservation near Parker, Arizona, the Palo Verde Irrigation District near Blythe, California, other miscellaneous users along the river, and transit losses between Parker Dam and Imperial Dam. Deliveries to Mexico were made up of river water delivered to Imperial Dam and

waste and drainage return flows from water users below Imperial Dam. The small regulatory waste of 5,560 acre-feet was the result of careful scheduling and of making good use of the small amount of regulatory storage space in Imperial, Laguna, and Senator Wash Reservoirs.

The major water diversion above Parker Dam was that by Metropolitan Water District of Southern California. The District pumped 1,251,287 acre-feet from Lake Havasu during water year 1972 which included 849 acre-feet for emergency delivery to Tijuana, Mexico, pursuant to Minute No. 240. Releases of 8,455,000 acre-feet were made from Lake Mohave during water year 1972 to meet the requirements for releases at Parker Dam, diversions to Metropolitan Water District, diversions to contractors for small uses, diversions to other miscellaneous users, along with quantities to offset evaporation and other transit losses between Davis and Parker Dams and to maintain the programmed levels of Lake Havasu.

Releases of 8,268,000 acre-feet were made from Lake Mead at Hoover Dam during water year 1972 to regulate the levels of Lake Mohave and to provide for the small uses and the losses from that reservoir. In addition there were 66,290 acre-feet diverted from Lake Mead for use by Lake Mead National Recreation Area, Boulder City, Basic Management, Inc., and contractors of the Colorado River Commission of Nevada. The total releases and diversions from Lake Mead during water year 1972 were 8,334,000 acre-feet.



Irrigated grape vineyard in Salt River Valley, Arizona

Water Quality Control

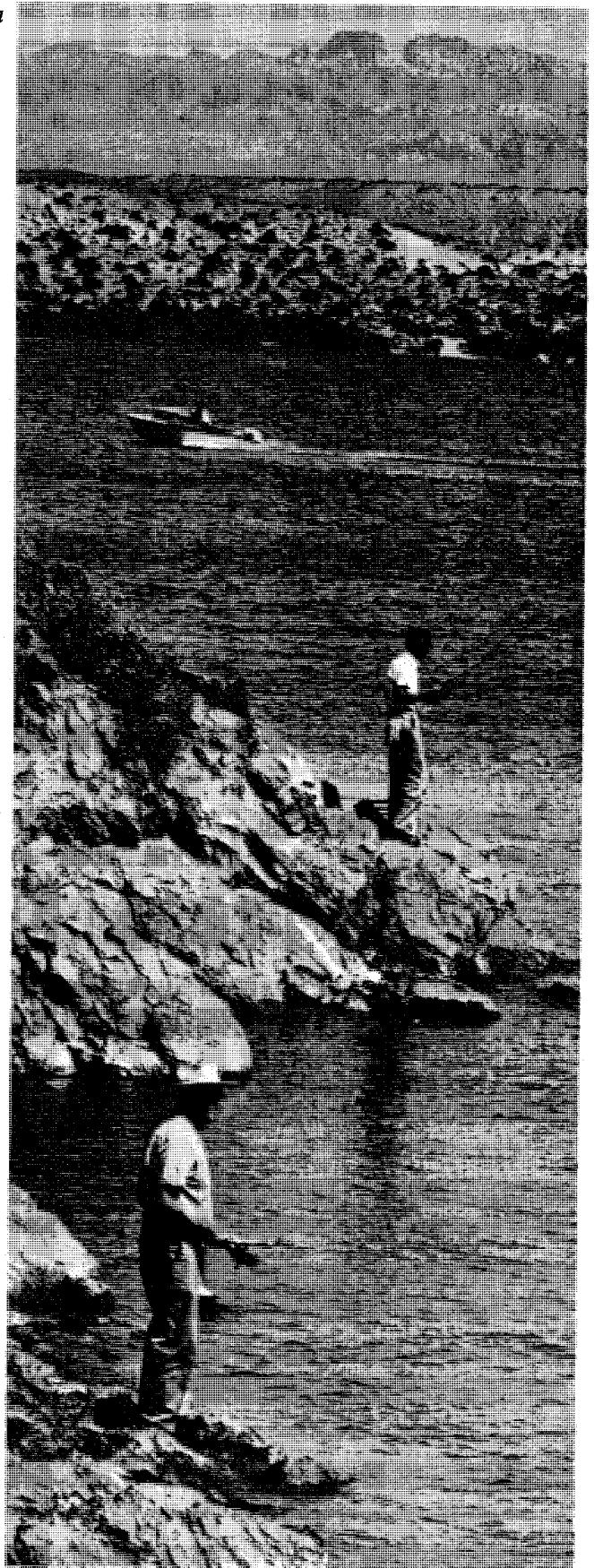
WATER QUALITY OPERATIONS DURING WATER YEAR 1972

Since water quality aspects of Colorado River operations are extensively described in the biennial series entitled "Quality of Water, Colorado River Basin," which is being issued concurrently with this report (Progress Report No. 6), only minimal discussion of this aspect of operation is presented in this report:

Specific water quality operations were performed pursuant to Minutes Nos. 218 and 241 with Mexico such that during water year 1972, the United States bypassed 79,382 acre-feet of drainage water to the Colorado River below Morelos Dam and replaced it with a like amount of other water. Even though this was the only specific operation carried out for quality purposes, other incidental benefits accrue to water quality from normal procedures. Water is stored in reservoirs during the nonirrigation season and during the snowmelt runoff period when the water is surplus to the immediate requirements. As the streamflows diminish in the late summer, storage water is released as needed to supplement the natural flows in meeting demands. Although water quality control is not generally recognized as a beneficial use of surface water, this type of release pattern greatly enhances the quality of water in the basin.

FUTURE WATER QUALITY CONTROL

In recognizing the need to manage the water quality of the Colorado River, it has been recommended that the salinity increases in the river will be minimized through a salinity program generally described in the Department of the Interior's report "Colorado River Quality Improvement Program," dated February 1972. This program calls for a basin-wide approach to salinity control while the Upper Basin continues to develop its Compact-apportioned waters.



Enhancement of Fish and Wildlife

UPPER BASIN

During the first part of March releases were increased from 700 c.f.s. to 1,650 c.f.s. to force the geese below Fontenelle Dam to build their nests at a higher elevation and away from the river. Releases were then controlled throughout the geese-nesting period to avoid inundating the nests. The interim operating rules for Fontenelle Reservoir call for a continuous flow of at least 300 c.f.s. in the channel immediately below the dam for the benefit of fish habitat.

Fishing below Flaming Gorge Dam has been enhanced by keeping a minimum of 400 c.f.s. in the river. During water year 1972, Utah Fish and Game Department requested that a minimum of 1,200 c.f.s. be released from Flaming Gorge Dam while the trout were spawning. This minimum release was met by the Bureau of Reclamation during the spawning season.

A constant release of 80 c.f.s. throughout the winter 1971-72 assured good fish habitat between Taylor Park and Blue Mesa Reservoirs. Coordinated operation between Taylor Park and Blue Mesa Reservoirs in delivering irrigation water to the Uncompahgre Project provided additional fishery and recreation opportunities between the two reservoirs. The interim operating rules specify a minimum of 200 c.f.s. for

good fish habitat below Morrow Point Dam and below the Gunnison Tunnel.

A continuous flow of at least 400 c.f.s. was maintained immediately below Navajo Dam for good fish propagation.

Good habitat for fish was maintained in the river below Glen Canyon Dam.

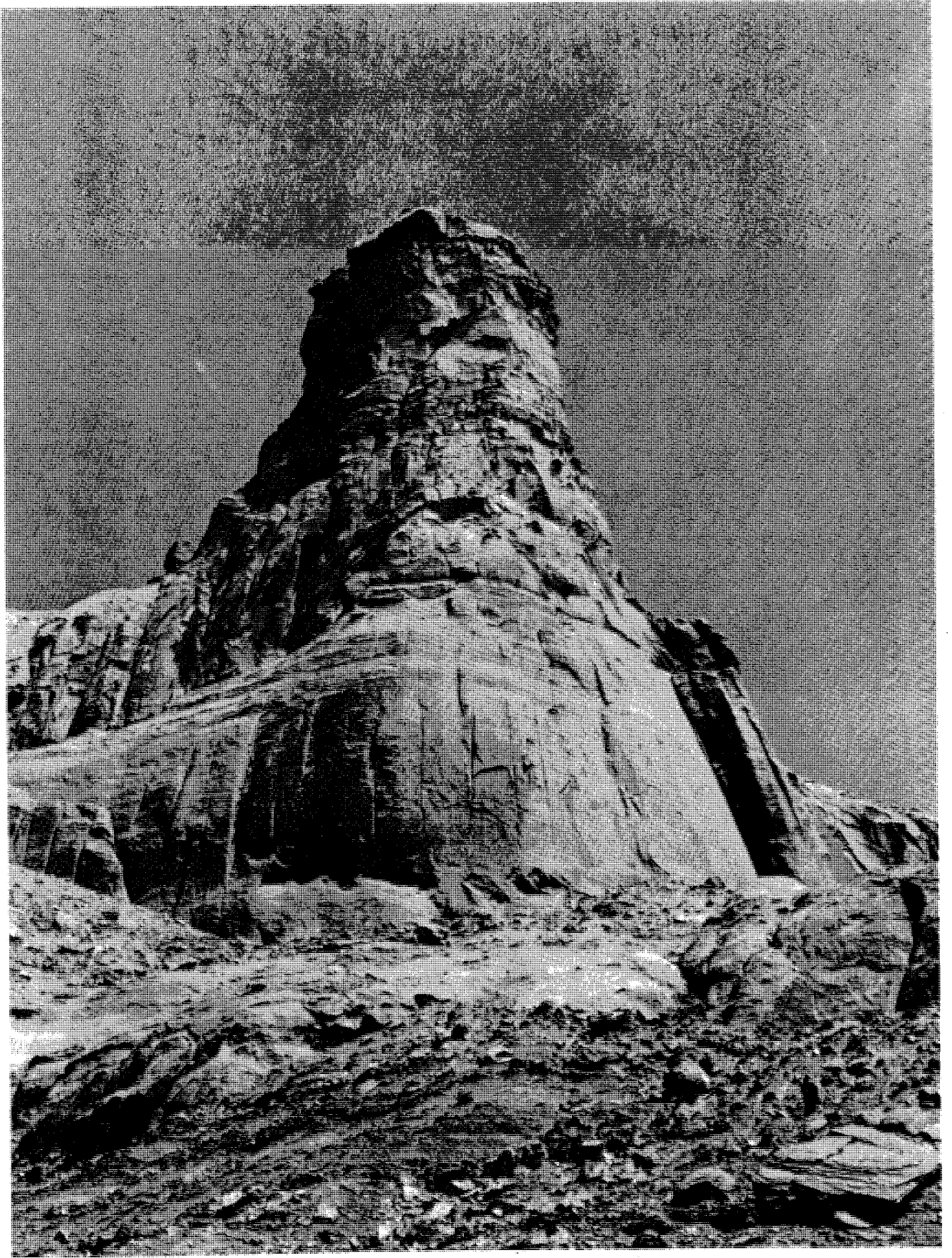
LOWER BASIN

Releases from Lake Powell were sufficient to maintain the level of Lake Mead relatively constant from early April through July and to raise the level about 1.6 feet during August. This provided lake levels favorable to the spawning and survival of the young bass. Weather conditions were also favorable through most of the period this year. This combination of favorable conditions contributed to the resulting excellent spawn and survival of the young bass this season.

Releases from Lakes Mohave and Havasu were regulated such that minimum flows below the dams were never less than 2,000 c.f.s. This was done to provide a stabilized fish habitat along the lower river.



Waterfowl on Topock Marsh, Lower Colorado River, Arizona



Gunsite Butte, Colorado River Plateau Country, Utah-Arizona

Preservation of Environment

Preservation or enhancement of environment is a matter of the highest importance in the planning, construction, and operation of the Colorado River Storage Project. Contracts for water services, grants of right-of-way and indentures of lease for use of Federal land, supply contracts, and participating agreements executed by the Secretary of the Interior include language to control water and air pollution, to require restoration and reseeding of lands scarred by construction and operation activities, and to encourage conservation of the esthetic beauty of nature.

Operation of the reservoirs of the Colorado River system recognizes the needs to schedule releases from Fontenelle and Flaming Gorge Reservoirs so that the flow pattern will not adversely affect the ecology of downstream geese and duck nesting areas. Minimum flows are maintained below all dams to provide a desirable habitat for fish, animal, and plant life. Flood control operations at Navajo Reservoir and Lake Mead protect the downstream channels and flood plains from erosion and scouring during periods of high flow. Recent proposals for several large thermal-electric generating plants cooled with water from Reclamation facilities in the Colorado River system have required special consideration to protect the environment and ecology of the area. Particulate emissions from combustion of coal, provision for control of noxious gases, appearance, and esthetic considerations are some of the factors in which Reclamation has become involved in planning these plants. The Secretary of the Interior's responsibility for pollution control at the Navajo, Kaiparowits, Four Corners, Huntington Canyon, and San Juan Powerplants has been

delegated to the Commissioner of Reclamation and redelegated to the Regional Director of the Upper Colorado Region. The Regional Director of the Lower Colorado Region has been delegated responsibility for pollution control at the Mohave Powerplant.

During the past year construction has continued on the Navajo and San Juan Powerplants. The final Environmental Statement for Navajo Powerplant, FES 72-1, was filed with the Council on Environmental Quality on February 4, 1972. A draft of the final Environmental Statement for the San Juan Powerplant was sent to the Council on Environmental Quality on August 3, 1972.

Releases from Lake Powell were made in sufficient quantities, as discussed previously, to enhance the Lake Mead fishery. Fish habitat was enhanced in the river below Glen Canyon Dam by maintaining adequate flow rates.

In order to assess the potential impact of thermal powerplants on the Colorado River Basin and adjacent areas, the Secretary of the Interior has made an appraisal report of the requirements and availability of resources needed to permit an orderly development of thermal-electric power to meet a logical portion of the projected demand for electric power through year 1990 while protecting the quality of the environment. One of the resources vital to any thermal power development in the semiarid Southwest is water for cooling. The report identifies the sources and amounts of water available for thermal powerplant use as well as the compacts, laws, and other constraints likely to govern use of the available water for this purpose.

Projected Plan of Operation Under Criteria for Current Year.

DETERMINATION OF "602(a) STORAGE"

Section 602(a)(3) of the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537), provides for the storage of Colorado River water not required to be released under Articles III(c) and III(d) of the Colorado River Compact in Upper Basin reservoirs to the extent the Secretary finds it to be reasonably necessary to assure Compact deliveries without impairment of annual consumptive uses in the Upper Basin. Article II of the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs pursuant to that Act provides that the annual plan of operation shall include a determination by the Secretary of the quantity of water considered necessary as of September 30 of the current year to be in storage as required by Section 602(a) of P.L. 90-537 after consideration of all applicable laws and relevant factors, including, but not limited to the following:

- (a) Historic streamflows;
- (b) The most critical period of record;
- (c) Probabilities of water supply;
- (d) Estimated future depletions in the Upper Basin, including the effects of recurrence of critical periods of water supply;
- (e) The "Report of the Committee on Probabilities and Test Studies to the

Task Force on Operating Criteria for the Colorado River," dated October 30, 1969, and such additional studies as the Secretary deems necessary;

- (f) The necessity to assure that Upper Basin consumptive uses not be impaired because of failure to store sufficient water to assure deliveries under Section 602(a)(1) and (2) of P.L. 90-537.

Taking into consideration these and other relevant factors, the Secretary has determined that the active storage in Upper Basin reservoirs forecast for September 30, 1973, on the basis of average runoff during the current year, exceeds this "602(a) Storage" requirement under any reasonable range of assumptions which might be realistically applied to those items which he is directed to consider in establishing this storage requirement. Therefore, the accumulation of "602(a) Storage" is not the criterion governing the release of water during the current year. The Lake Powell active storage forecast for September 30, 1973, is projected to be less than the Lake Mead active storage forecast for that date.

The plan of operation during the current year is to release a minimum of 8,230,000 acre-feet as stated in Article II(2) of the Criteria.



Imperial Dam and desilting works, Arizona-California

Lower Basin Requirements

MEXICAN TREATY OBLIGATIONS

Annual calendar year schedules of monthly deliveries of water in the limitrophe section of the Colorado River, allotted in accordance with the Mexican Water Treaty of 1945, are formulated by the Mexican Section and presented to the International Boundary and Water Commission before the beginning of each calendar year. Mexico has the right, upon 30 days' notice in advance to the United States Section, to modify, within the total schedule, any monthly quantity prescribed by the schedule by not more than 20 percent of the monthly quantity. In addition to the 1.5 million acre-foot minimum Treaty requirement, approximately 118,000 acre-feet are projected for delivery pursuant to Minute No. 241 and approximately 5,000 acre-feet are projected in regulatory waste. The total delivery to Mexico for water year 1973 is estimated to be 1,623,000 acre-feet.

CONSUMPTIVE USE AND LOSS REQUIREMENTS

A release of 6,685,000 acre-feet from Lake Havasu has been projected for water year 1973 to meet consumptive use requirements in the United States below Parker Dam, transit losses in the river between Parker Dam and the Mexican border and a 1,623,000 acre-foot deliv-

ery to Mexico.

The Metropolitan Water District of Southern California is expected to divert 1,253,000 acre-feet by pumping from Lake Havasu. Consumptive uses by small users, river losses or gains, and reservoir losses between Davis Dam and Parker Dam are projected to be 363,000 acre-feet for water year 1973.

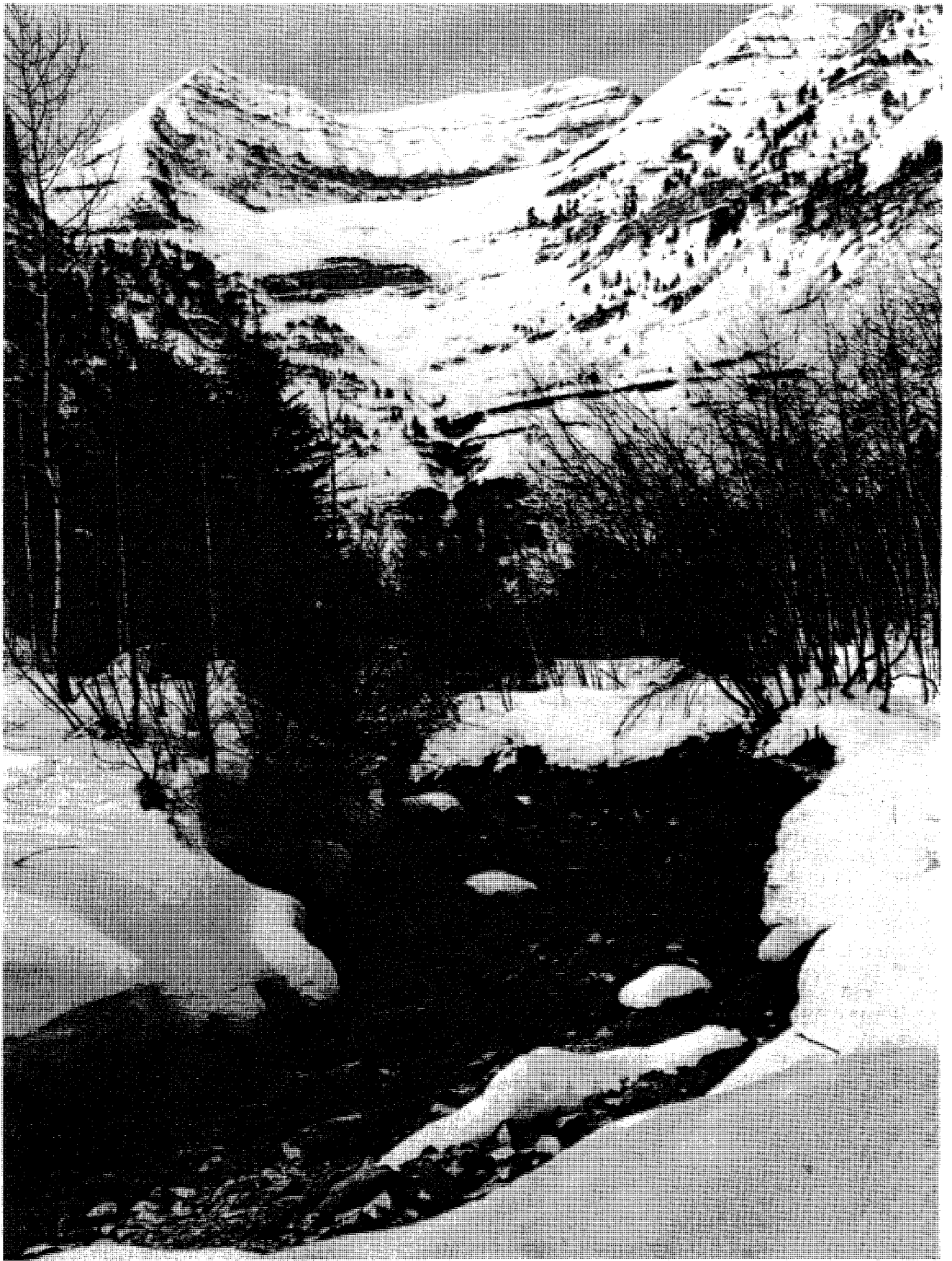
There are no major users between Hoover Dam and Davis Dam. Consumptive uses by small users, river losses or gains, and reservoir losses between Hoover Dam and Davis Dam are projected to be a net gain of 108,000 acre-feet for water year 1973.

The net diversions from Lake Mead are projected at 65,000 acre-feet for water year 1973. Evaporation from Lake Mead is expected to be about 769,000 acre-feet, and tributary inflow between Glen Canyon Dam and Lake Mead is expected to be about 880,000 acre-feet.

REGULATORY WASTES

A regulatory waste of 5,000 acre-feet has been projected as being lost from the Lower Colorado River for water year 1973 as indicated in the section under Mexican Treaty obligations.

The guides set forth in the Report on Reservoir Regulations for Flood Control Storage at Hoover Dam and Lake Mead are in effect, but no flood control releases are anticipated for water year 1973.



Start of snowmelt runoff from high mountain watershed, Utah

Plan of Operation - Water Year 1973

The projected operation of each of the reservoirs in the Colorado River Basin during water year 1973 for average runoff conditions is described in the following paragraphs. Charts 1 through 9 show hydrographs of the projected monthly outflow from the reservoirs and the projected end-of-month elevation and active storage in the reservoirs for average and three other assumptions of 1973 modified runoff from the basin. The four assumptions are (1) AVERAGE based on the 1906-68 record of runoff, (2) UPPER QUARTILE based on flows exceeded 25 percent of the time during 1906-68, (3) LOWER QUARTILE based on flows exceeded 75 percent of the time during 1906-68, and (4) MOST ADVERSE based on the lowest year of record which occurred in 1934.

The projected operations of Lakes Mead, Mohave, and Havasu are the same under all four of the runoff assumptions since a release of 8.23 million acre-feet of water from Lake Powell is scheduled during water year 1973 for each of the assumed runoff conditions.

Upper Basin Reservoirs

Fontenelle

It is planned to lower the level of the reservoir through the fall and winter months until a water surface elevation of about 6,485 feet is reached, then from the last of March through April to hold releases at about 1,450 c.f.s. to encourage wild geese to nest back away from the river. With average runoff during the spring months, Fontenelle Reservoir will fill by the end of June. After the spring runoff the reservoir level will be controlled by adjusting the releases through the powerplant to slowly reduce the elevation to 6,500 feet by the end of the summer 1973. (Chart 1)

Flaming Gorge

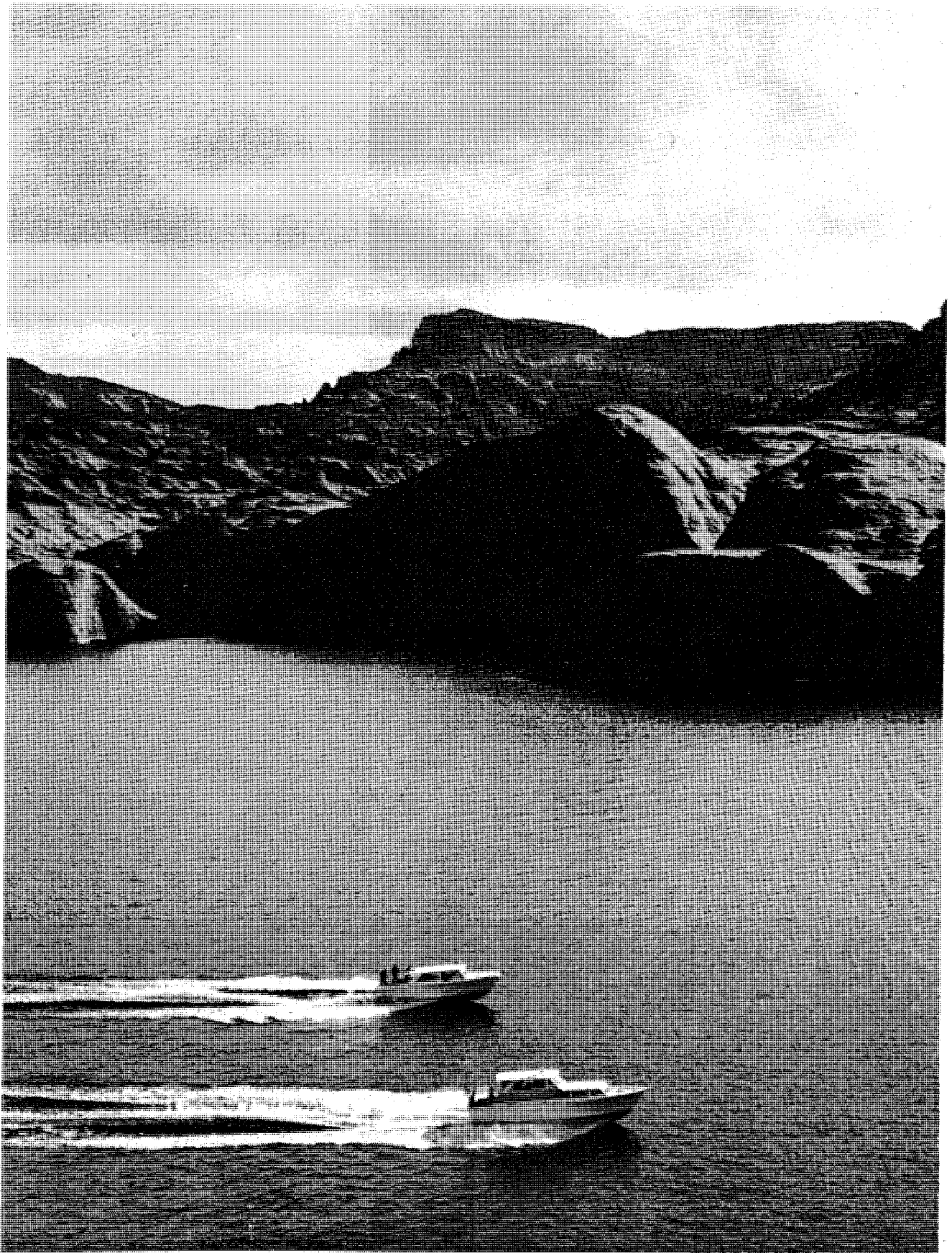
At the beginning of water year 1973 the active reservoir storage was 3,465,000 acre-feet with a water surface at elevation 6,033 feet. The reservoir level will be lowered about 8 feet by March of the current year but should remain high enough until the spring runoff so that boats can be launched from all of the nine boat ramps. During the latter part of March and through April 1973 releases from the reservoir will be managed to encourage the geese to nest back away from the river in Brown's Park. This will be accomplished by varying the releases every other day from high to low flows until nests are established. Flow will then vary on a more uniform pattern throughout the summer, but the river should not exceed 4,000 c.f.s. and normally would not be less than 1,500 c.f.s. Releases should be about 150,000 acre-feet per month through the rest of the summer for a water year total of 1,700,000 acre-feet. (Chart 2)

Curecanti Unit

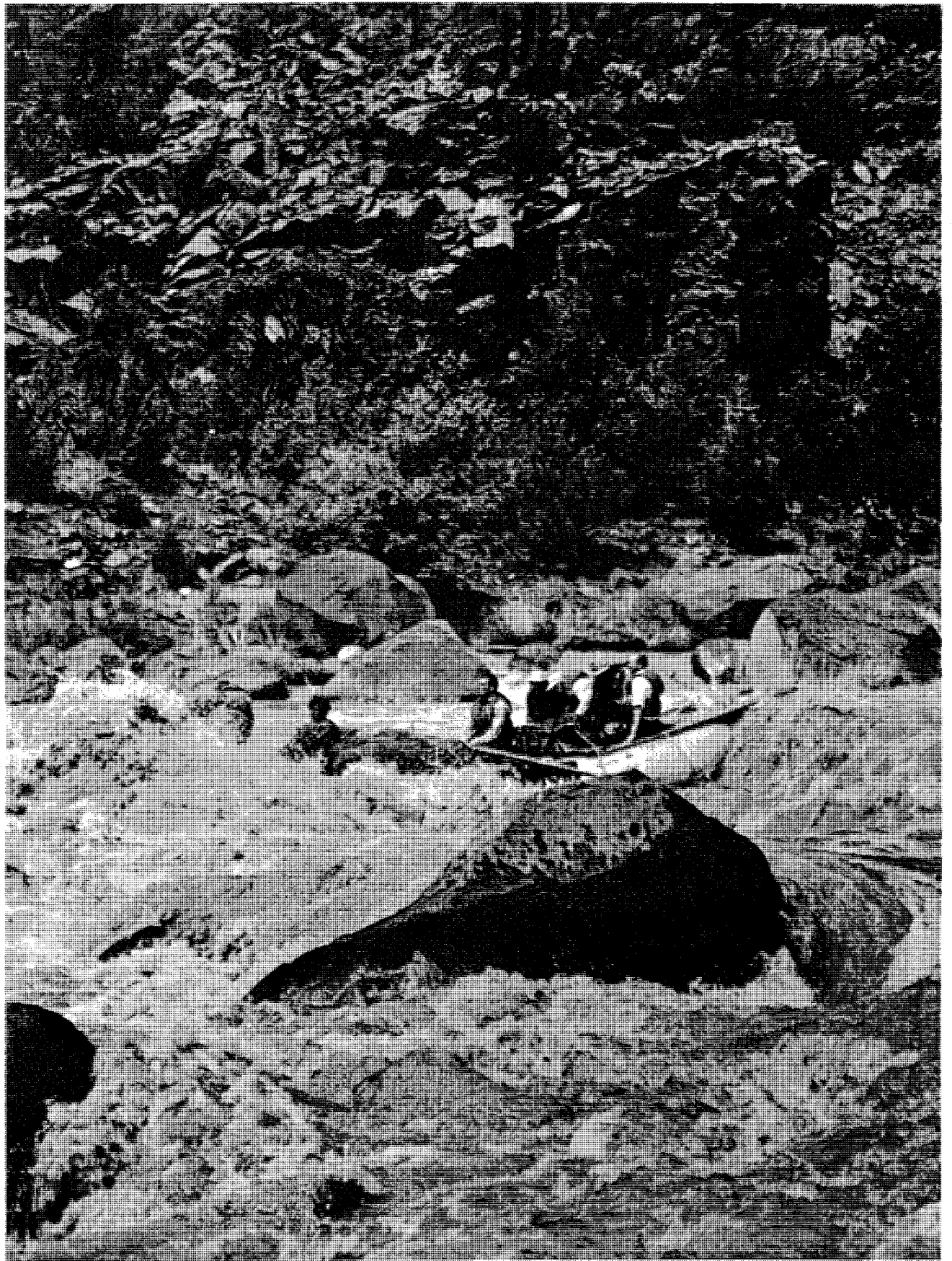
During the current year, Blue Mesa should reach a low for the year in March 1973 of elevation 7,453 feet with an active storage of 330,000 acre-feet. With average inflow during the spring of 1973 the reservoir should reach an elevation of 7,511 feet with an active storage of 750,000 acre-feet. At this elevation the reservoir has a surface area of 8,730 acres and a reservoir length of 23 miles. (Charts 3 and 4)

Navajo Reservoir

On September 30, 1972, Navajo Reservoir had an active storage of 898,100 acre-feet with an elevation 6,019 feet. During October through March releases will be controlled to lower the reservoir elevation to 6,010 feet prior to spring runoff. Average inflow would cause the reservoir to reach elevation 6,050 feet with an active storage of 1,220,000 acre-feet. It will be maintained for recreational purposes at or near this level for the remainder of the summer. (Chart 5)



Boating on Lake Powell



Running the rapids of Hells Halfmile on Green River in Colorado

Glen Canyon Lake Powell

For the current year Lake Powell level should recede through the fall and winter months to a low elevation of 3,596 feet with an active storage of 11.8 million acre-feet. Assuming an average April-July 1973 runoff the resulting inflow of 8.0 million acre-feet should cause the lake to reach elevation 3,622 feet with an active storage of 14.5 million acre-feet. This will be about 58 percent of the active capacity of the reservoir. The lake will have a length of 182 miles and a water surface area of 110,850 acres. Total release of 8.23 million acre-feet is scheduled from Lake Powell during water year 1973 to satisfy power market requirements and meet other downstream demands. (Chart 6)

Lower Basin Reservoirs

Lake Mead

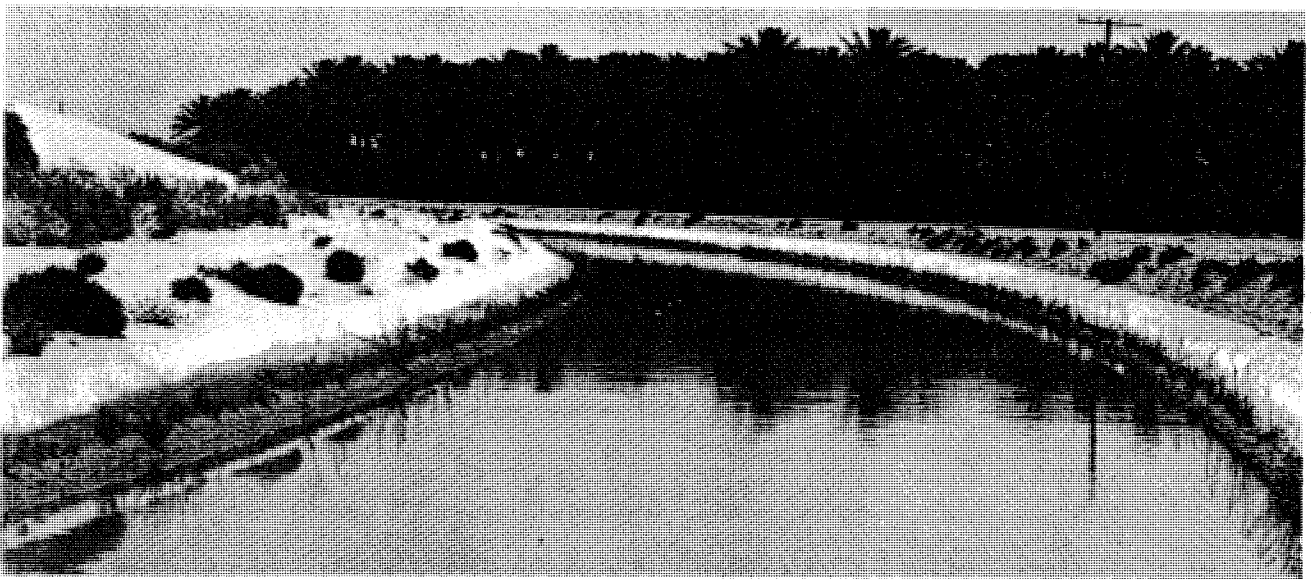
The level of Lake Mead should gradually rise 4 feet during the current year to elevation 1,163 feet by January 31, 1973. The level will then drop about 4 feet to elevation 1,159 feet and remain near this elevation until the end of the water year. At this level the lake will have an active storage of 17.5 million acre-feet. A total of 8.2 million acre-feet is scheduled to be released from Lake Mead during water year 1973 to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 7)

Lake Mohave

The level of Lake Mohave is scheduled at about its minimum elevation during October, the first month of the current operating year. The level should rise through the fall and winter months to elevation 643 feet by February 28, 1973. It should remain near that elevation through April and rise to its yearly high of 645 feet at the end of May 1973. The level of Lake Mohave is expected to be drawn down during the summer months of heavy irrigation use to elevation 631 feet at the end of water year 1973. A total of 8.3 million acre-feet is scheduled to be released from Lake Mohave during this water year to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 8)

Lake Havasu

Lake Havasu is scheduled at the highest levels consistent with the requirements for maintaining flood control space. The yearly low elevation of 446 feet is scheduled for the December through February high-flood-hazard period. The yearly high of 449 feet is scheduled for the low-flood-hazard months of May and June. A total of 6.7 million acre-feet is scheduled to be released from Lake Havasu during this water year to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 9)



Coachella Canal near Indio California



As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral land, park and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

