

Hoquiam, Aberdeen, and Cosmopolis are subject to extensive damage resulting from high tidal stages in Grays Harbor caused by winds. Above these municipal areas, the basin is subject to damaging headwater floods with an approximate frequency of once in 3 years.

The Chief of Engineers finds that works of improvement for the reduction of headwater flood damage cannot be justified at this time. He finds that protection against tidal floods at Aberdeen, Hoquiam, and Cosmopolis are warranted. He recommends protection for these areas by a system of earth levees, concrete and sheet piling wall, and the raising of railway embankments and appurtenant works, at an estimated cost of \$669,000.

The committee is of the opinion that the project for the protection of municipal areas in the Chehalis River Basin is economically justified and recommends the adoption of the project in accordance with the recommendations of the Chief of Engineers.

HANAPEPE RIVER, ISLAND OF KAUAI, T. H.

(Report transmitted March 15, 1944)

Hanapepe River drains an area of 30 square miles in the south central portion of the Island of Kauai, T. H. It flows southwesterly and empties into the Hanapepe Bay where there is an existing federally improved harbor known as Port Allen; 1,170 of the 1,500 inhabitants in the basin reside in the town of Hanapepe.

The flood plain of the Hanapepe River extends from the bay approximately 2.3 miles upstream and is 1,000 to 3,000 feet wide containing about 144 acres in the town and 230 acres of agricultural land above the town. During the past 20 years the river has been subjected to six important damaging floods.

The plan of improvement recommended by the Chief of Engineers would protect about 27 acres, including the principal business and residential property in the town of Hanapepe against the largest flood reasonably to be expected on an average of once in 100 years. The work consists of the construction of a concrete flood wall extending from new Kauai Highway to the cliffs, the raising of a short section of roadway at the upper end, and to assure effectiveness of the work, replacement of railway trestles which accumulate quantities of drift during flood periods, all at an estimated cost of \$73,000.

The committee believes that the plan of flood protection for the business and residential sections of the town of Hanapepe is warranted and recommends adoption of the project recommended by the Chief of Engineers.

AMENDMENT NO. 29

On page 25, after line 19, insert the following:

Pasquotank River, North Carolina.

Amendment 29 includes in the bill authorization for a preliminary examination and survey of Pasquotank River, N. C.

AMENDMENT NO. 30

On page 25, after line 24, insert the following:

For flood control, rice irrigation, navigation, pollution, salt-water intrusion, and drainage on all streams and bayous in southwest Louisiana, west of the West Atchafalaya Basin protection levee, and south of the latitude of Boyce; on all

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streams and bayous in Louisiana lying between the East Atchafalaya Basin protection levee and the Mississippi River; and on Amite River and tributaries Louisiana

Amendment 30 includes in the bill authorization for a preliminary examination and survey of certain streams in Louisiana for flood control, rice irrigation, navigation, pollution, salt-water intrusion, and drainage.

AMENDMENT NO. 31

On page 26, after line 21, insert the following:

Arkansas River above Pine Bluff, Arkansas, with special reference to control of caving banks in the vicinity of Hensley Bar and the McFadden Place, in Jefferson County, Arkansas.

Amendment 31 includes in the bill authorization for a preliminary examination and survey of the Arkansas River above Pine Bluff, Ark., with a special reference to the control of caving banks in the vicinity of Hensley Bar and the McFadden Place, in Jefferson County, Ark.

AMENDMENT NO. 32

On page 27, after line 2, insert the following:

Corte Madera Creek, Marin County, Calif.

Amendment 32 includes in the bill authorization for a preliminary examination and survey of Corte Madera Creek, Marin County, Calif.

AMENDMENT NO. 33

On page 27, after line 4, insert the following:

Elkhorn River and its tributaries, Nebraska.

Amendment 33 includes in the bill authorization for preliminary examination and survey of the Elkhorn River and its tributaries, Nebraska.

AMENDMENT NO. 34

On page 27, line 5, strike out "\$810,000,000" and insert in lieu thereof "\$959,465,000".

Amendment 34 raises to \$959,465,000 the total authorization provided by the bill in order that sufficient authorization may be available to cover the additional improvements included in the bill by the amendments of the Senate.

PROJECTS RECOMMENDED BY THE SECRETARY OF AGRICULTURE

Amendments 35 to 42, inclusive, pertain to the program of the Department of Agriculture for run-off retardation and soil-erosion prevention on certain watersheds of the United States for which authorization under the flood control legislation is proposed in H. R. 4485. The bill as passed by the House of Representatives, contains items authorizing plans of improvements for eight watersheds. The amendments recommended by the committee make certain modification in the language of the bill as it passed the House of Representatives and includes authorization for three additional watersheds.

CONSTRUCT CERTAIN PUBLIC WORKS FOR FLOOD CONTROL 27

AMENDMENT NO. 35

On page 28, line 11, change the period after the word "requirements" to a colon and insert the following:

Provided further, That nothing in this section shall be construed as approving or authorizing the acquisition of any land by the Federal Government.

The committee heard testimony from representatives of the Department of Agriculture pertaining to their program for run-off retardation and soil-erosion prevention. The testimony presented at these hearings showed that several of the Department of Agriculture's reports recommend the acquisition of land. The committee believes that it is unwise for the Federal Government to acquire large tracts of land for watershed treatment programs under flood-control legislation. It has, therefore, recommended amendment No. 35 which provides that nothing in this section shall be construed as approving or authorizing the acquisition of any land by the Federal Government.

AMENDMENT NO. 36

On page 28, after line 18, insert the following:

SANTA YNEZ RIVER WATERSHED

The program on the Santa Ynez River watershed is hereby approved substantially in accordance with the recommendation of the Acting Secretary of Agriculture in House Document Numbered 518, Seventy-eighth Congress, first session, at an estimated cost to the United States of \$418,000.

SANTA YNEZ RIVER WATERSHED

(H. Doc. No. 518, 78th Cong., 2d sess.)

Amendment 36 authorizes the program of watershed treatment on the Santa Ynez River, Calif., at an estimated cost of \$418,000.

AMENDMENT NO. 37

On page 28, line 24, strike out "\$32,000,000" and insert in lieu thereof "\$27,348,000".

TRINITY RIVER, TEX.

(H. Doc. No. 708, 77th Cong., 2d sess.)

Amendment 37 reduces the estimated cost of the Department of Agriculture's program on the Trinity River watershed from \$32,000,000 to \$27,348,000. This reduction is the estimated cost of the acquisition of land and the treatment of that land by the Department of Agriculture.

AMENDMENT NO. 38

On page 29, line 7, strike out "\$4,221,000" and insert in lieu thereof "\$2,171,000."

LITTLE TALLAHATCHIE RIVER, MISS.

(H. Doc. No. 892, 77th Cong., 2d sess.)

Amendment 38 reduces the estimated cost of the Department of Agriculture's program on the Little Tallahatchie River watershed from \$4,221,000 to \$2,171,000. This reduction is the estimated cost

of the acquisition of land and the treatment of that land by the Department of Agriculture.

AMENDMENT NO. 39

On page 29, after line 7, insert the following:

YAZOO RIVER WATERSHED

The program on the Yazoo River watershed is hereby approved substantially in accordance with the recommendation of the Acting Secretary of Agriculture in House Document Numbered 564, Seventy-eighth Congress, second session, at an estimated cost to the United States of \$12,500,000.

YAZOO RIVER WATERSHED, MISSISSIPPI

(H. Doc. No. 564, 78th Cong., 2d sess.)

Amendment 39 authorizes the program of the watershed treatment on the Yazoo River, Miss., at an estimated cost of \$12,500,000.

AMENDMENT NO. 40

On page 30, after line 2, insert the following:

BUFFALO CREEK WATERSHED, NEW YORK, (BUFFALO, CAYUGA, AND CAZENOVIA CREEKS)

The program on the watershed of Buffalo Creek and its tributaries, Cayuga and Cazenovia Creeks, is hereby approved substantially in accordance with the recommendation of the Acting Secretary of Agriculture in House Document Numbered 574, Seventy-eighth Congress, second session, at an estimated cost to the United States of \$739,000.

BUFFALO CREEK WATERSHED, NEW YORK, (BUFFALO, CAYUGA, AND CAZENOVIA CREEKS)

(H. Doc. No. 574, 78th Cong., 2d sess.)

Amendment 40 authorizes the program of watershed treatment on the Buffalo Creek and its tributaries, Cayuga and Cazenovia Creeks, N. Y., at an estimated cost of \$739,000.

AMENDMENT NO. 41

On page 30, line 19, strike out "\$11,243,000", and insert in lieu thereof "\$7,007,000."

WASHITA RIVER, OKLA. AND TEX.

(H. Doc. No. 275, 78th Cong., 1st sess.)

Amendment 41 reduces the estimated cost of the Department of Agriculture's program on the Washita River, Okla. and Tex., from \$11,243,000 to \$7,007,000. This reduction is the estimated cost of the acquisition of land and the treatment of that land by the Department of Agriculture.

AMENDMENT NO. 42

On page 31, line 6, strike out "10", and insert in lieu thereof "12."

Amendment 42 is to take into account the new section numbering of the bill as recommended by the committee.

CONSTRUCT CERTAIN PUBLIC WORKS FOR FLOOD CONTROL 29

AMENDMENT NO. 43

On page 32, after line 2, insert a new section as follows:

SEC. 15. (a) The Chief of Engineers of the United States Army is authorized and directed to make examinations of any privately owned or operated dam constructed across navigable waters of the United States, or across tributaries thereof.

(b) Whenever it shall appear, after reasonable notice and opportunity for hearing to the person or corporation owning or controlling any such dam, that such dam is being operated or maintained in such a manner as to jeopardize the safety of persons or property either above or below such dam, the Chief of Engineers shall enter orders requiring such changes in the operation or maintenance of such dam as he deems appropriate and necessary, and prescribing a reasonable time within which such changes shall be made. If, at the end of such reasonable time, the changes in operation or maintenance ordered by the Chief of Engineers have not been made, the Chief of Engineers shall notify the United States district attorney for the district in which such dam or any part thereof is situated, who shall forthwith cause criminal proceedings to be instituted against the person, or corporation, owning or controlling such dam.

(c) Any person or corporation willfully failing or refusing to comply with an order of the Chief of Engineers issued pursuant to this section shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine not exceeding \$5,000. Every month during which such willful failure or refusal continues shall be deemed to be a separate offense and shall subject such person or corporation to the penalties herein prescribed.

Amendment 43 proposes a new section which authorizes the Chief of Engineers to make inspections of dams constructed across navigable waters of the United States or across tributaries thereof and to require such changes in the operation and maintenance of such dams as he may deem appropriate and necessary to safeguard life and property.

Considerable testimony was presented to the committee to the effect that in certain cases private dam and reservoir projects have been operated in such manner as to increase flood hazards. They desire that the Chief of Engineers inspect and supervise the operation of such projects to safeguard against such hazards.

SUMMARY OF PROJECTS IN THE BILL

The Committee on Flood Control of the House of Representatives gives in detail in its Report No. 1309, dated March 29, 1944, the explanation of projects of the War Department included in the flood control bill as passed by the House of Representatives. These projects and page references to the discussion thereof in Report No. 1309 are tabulated below.

River or basin	Authorization in H. R. 4485 as passed by House of Rep- resentatives	Page in Report No. 1309
Connecticut River.....	\$30,000,000	8, 9
Thames River.....	7,200,000	9
Housatonic River.....	5,151,000	9, 10
Susquehanna River.....	10,374,000	10, 11
Mobile-Alabama-Coosa River.....	14,400,000	11, 12
Lower Mississippi River.....	210,717,000	12-15
Red-Ouachita River.....	3,800,000	15
Arkansas River.....	46,708,400	16-18
White River.....	45,000,000	19
Upper Mississippi.....	10,708,500	19-22
Red River of the North.....	902,940	22
Missouri River.....	216,785,730	23-29
Ohio River.....	70,000,000	29-31
Great Lakes.....	775,200	31-33
Colorado River (Texas).....	8,360,000	33, 34

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River or basin	Authorization in H. R. 4485 as passed by House of Rep- resentatives	Page in Report No. 1309
Brazos River.....	\$15,000,000	34, 35
Rio Grande Basin.....	68,600	35
San Diego River.....	370,000	35, 36
Ventura River.....	1,600,000	36
Santa Ana River.....	10,000,000	36-38
Los Angeles-San Gabriel River Basin.....	25,000,000	38
Sacramento River.....	15,000,000	39
San Joaquin River.....	40,400,000	39-45
Coquille River.....	143,000	45
Nehalem River.....	23,000	45, 46
Willamette River.....	20,000,000	46, 47
Columbia River.....	1,339,000	47, 48
Willapa River.....	127,000	48, 49
Total.....	807,953,270	

The War Department projects added by the proposed amendments of the committee and discussed previously in this report are tabulated below:

River or basin:	Authorization
Lake Champlain Basin.....	\$2,120,000
Blackstone River.....	4,187,000
Roanoke River.....	36,140,000
Yadkin-Pee Dee River Basin.....	10,840,000
Edisto River.....	139,000
Savannah River.....	35,300,000
Red-Ouachita River.....	14,080,000
Upper Mississippi River.....	15,152,000
Red River of the North.....	1,502,410
Missouri River.....	1,610,300
Ohio River.....	27,000,000
Great Lakes.....	5,360,000
Great Salt Basin.....	281,000
Colorado River.....	3,202,000
Pajaro River.....	511,160
Sacramento River.....	22,518,000
San Joaquin River.....	3,868,200
Napa River.....	460,000
Chehalis River.....	669,000
Territory of Hawaii.....	73,000
Total.....	185,013,070

O'MAHONEY AMENDMENT

The committee has considered the amendment offered by Senator O'Mahoney and its several revisions. Extensive testimony pro and con is contained in the hearings. Many considerations, among them the following, have caused the committee to reject the amendment and to recommend against the adoption of this or any similar amendment in connection with the flood-control bill.

(a) The proposed legislation is of very doubtful constitutionality and would give rise to much fruitless litigation with consequent serious delay to important construction work.

(b) Under the proposed O'Mahoney amendment any authorization of any project contained in the bill will become ineffective if objected to by any affected State (as defined in the amendment) or upon the objection of the Secretary of the Interior in respect to all projects west

of the ninety-seventh meridian. Every project contained in this bill has been thoroughly processed by the Corps of Engineers and opportunity given for anybody in interest to be heard in opposition. Furthermore, the committee has spent days in hearing testimony in respect to all the projects recommended to be authorized. All this laborious work on the part of the Army engineers and the committee and, finally, of the Congress, may in many instances prove to be "Love's labor lost." The amendment would in fact give the States a power of veto over legislation enacted by the Congress and approved by the President.

(c) The opportunity for States and other local interests to present their views on proposed improvements which the amendment purports to provide is at present fully safeguarded by existing procedures of the Federal construction agencies, especially the Corps of Engineers, and through the democratic process of open hearings before the committees of Congress which consider authorizing legislation and appropriate bills.

(d) The changes in water-use policy which would result from enactment of the amendment are of such far-reaching consequence that they go far beyond the jurisdiction of this committee and the scope of the flood-control bill. Any such broad modifications of existing policy should be considered in separate legislation dealing only with those subjects.

(e) If Congress does consider changing existing policies by legislation the committee recommends that all Federal agencies be placed on the same basis and specifically that Congress retain to itself the function of authorizing investigations and construction of water-use projects individually by act of Congress. This would require revision of the Federal Reclamation Act under which at the present time projects are authorized merely by means of a finding of feasibility by the Secretary of the Interior.

OTHER FLOOD-CONTROL BILLS CONSIDERED

Senators Clark of Missouri, McClellan, and Maybank introduced bills S. 1812, S. 1519, and S. 1876, respectively, as separate flood-control bills. These were considered by the committee as proposed amendments to H. R. 4485. The amendments proposed by the committee to H. R. 4485 incorporate a number of the provisions of all three of these separate flood-control bills.



HQ AR006243-HQ AR006297

78TH CONGRESS } 2d Session }	HOUSE OF REPRESENTATIVES {	REPORT No. 1309
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AUTHORIZATIONS FOR RESERVOIRS, LEVEES, AND FLOOD WALLS FOR FLOOD CONTROL

MARCH 29, 1944.—Committed to the Committee of the Whole House on the state
of the Union and ordered to be printed

Mr. WHITTINGTON, from the Committee on Flood Control, sub-
mitted the following

REPORT

[To accompany H. R. 4485]

The Committee on Flood Control, to whom was referred the bill (H. R. 4485) to authorize the construction of certain public works on rivers and harbors for flood control and for other purposes, having considered the same, report it favorably to the House and recommend that it do pass.

In its report of June 9, 1941 (Rept. No. 759, 77th Cong., 1st sess.), the Flood Control Committee stressed the need for the orderly development of the national program for flood control and recommended additional authorizations for the continuation of flood protection works in the large river basins where general comprehensive plans have been approved by Congress, and the authorization of certain flood control projects which had been recommended to Congress by the Chief of Engineers since the passage of the last preceding Flood Control Act. The legislation under consideration at that time was enacted by Congress and became Public Law 228, Seventy-seventh Congress, approved August 18, 1941.

RECENT FLOODS

During 1942 and 1943 widespread and damaging floods occurred in several of the major river basins of the Nation. In addition there were many flash floods which, while as devastating to the communities and economic life of the affected areas, did not receive the publicity given the floods in the industrial regions located in the flood plains of the principal drainage systems of the country.

A torrential downpour in the headwaters of the Delaware River in late May of 1942 caused havoc and loss of life in several towns in Pennsylvania and New York.

A flood equal to the great flood of 1903 on the Missouri River occurred in June of 1942 on the lower part of that stream, inundating tens of thousands of acres of fertile bottom lands. When the flood waters subsided many of the local levees were breached and others seriously weakened. The War Department, through the Corps of Engineers, undertook the task of repairing and restoring these levees to their former usefulness under the authority of section 5 of the Flood Control Act of 1941 which this committee wrote into that Flood Control Act. The flood on the Sacramento River in February of 1942 and the flood on the Missouri River in June of 1942 were the first major floods requiring Federal assistance in the restoration of flood-control structures since the passage of that act.

The flood of October 1942 in the Potomac River Basin exceeded the great flood of March 1936 at some points, particularly in the Shenandoah Valley. The flood-control structures built in accordance with the 1936 Flood Control Act, protected the military air bases at Bolling Field and the Anacostia Naval Air Station, which were several feet under water during the 1936 flood.

The same storm that swelled the Potomac River also brought floods to a wide area in the Southeastern States, notably the Rappahannock, Tombigbee, Coosa, and Pearl Rivers, and tributaries. Rome, Ga., and Collinsville, Ala., were safe behind their completed flood protection projects.

Six flood-control dams were in full or partial operation above Pittsburgh when the 1942-43 New Year's Eve flood hit the upper Ohio River. These reservoirs reduced the crest stage at Pittsburgh by 3 feet, prevented property damage there estimated at over \$15,000,000 and lowered flood stages as far downstream as Wheeling, to prevent additional damages estimated at \$14,000,000, in that reach of the Ohio River. The flood continued in major proportions on down below Cincinnati. As the rain did not cover the lower basin the cities along the lower river for the most part escaped major flood damages.

November and December of 1942, and January of 1943 brought floods to the Pacific coast, including major floods on the Willamette and Sacramento Rivers, in the Los Angeles area, and in the lower San Joaquin Valley.

The Missouri River experienced three severe floods in the spring of 1943, the first of which occurred in April on the upper Missouri, the second in May and June on the lower river as a part of floods visiting the Central and Midwestern States, and the third in late June, reached the highest stages since 1917 at St. Joseph and generally the highest levels since 1903 from Kansas City to the mouth of the Osage River. The spring of 1943 also brought major and record-breaking floods elsewhere in the midwestern part of the country with excessive rains forcing the Verdigris, Grand, Arkansas, White, St. Francis, Illinois, and Wabash Rivers out of their banks. These floods inundated over 7,100,000 acres of land and caused damages estimated at more than \$153,000,000. Seventy-one people lost their lives in these floods.

The seriousness of the recent floods has tended to focus the attention of the country on the need for accelerating the Federal program for flood protection during the post-war period. Those floods have demonstrated again that over a large part of our country floods can

RESERVOIRS, LEVEES, AND WALLS FOR FLOOD CONTROL**3**

come at any time of the year. They have shown, too, the large benefits that have resulted from the construction of the Federal flood-control structures which this committee has recommended and Congress has authorized.

EMERGENCY REPAIRS

The damage and havoc to flood-control structures built by local people and organizations for the protection of their homes and property were so great in recent floods that manifestly the existing authority of the Federal Government to assist in the repair and restoration of those works was inadequate to meet the situation.

Accordingly, several bills were introduced in the Congress to authorize the Federal Government to assist in the restoration of flood-control works. The Flood Control Committee held hearings on these bills. The Chief of Engineers and members of his staff presented to the committee such preliminary estimates as were then available as to the cost and extent of the required Federal assistance in this restoration work. The approval on July 12, 1943, of Public Law 138 of the Seventy-eighth Congress, gave new hope to the people of the stricken areas. That act authorized an appropriation of \$10,000,000 as an emergency fund to be expended under the direction of the Secretary of War and the supervision of the Chief of Engineers for the repair, restoration, and strengthening of levees and other flood-control works which were threatened or destroyed during the recent floods. The provisions of that act were in addition and supplemental to the regular authorizations contained in section 5 of the 1941 Flood Control Act and section 9 of the act approved June 15, 1936. Funds for carrying out the work authorized in Public Law 138 were provided in the Urgent Deficiencies Appropriation Act, Public Law 132, Seventy-eighth Congress, first session, also approved on July 12, 1943. The funds provided have been expended for emergency repair work at 450 localities, located principally in the upper Mississippi, Missouri, Illinois, Wabash, Arkansas, and White River Basins.

NEED FOR ADDITIONAL AUTHORIZATIONS

In approving the Flood Control Act of 1941, the President directed that no new flood control projects should be undertaken unless they were of direct importance to the defense of the Nation. Under this policy only 11 new flood-control projects have been initiated since the approval of the 1941 act. Of these, 4 dam and reservoir projects begun to supply power to important war activities were subsequently stopped; 2 dam and reservoir projects were completed and are now increasing industrial water supplies to steel-producing communities; and 5 local protection projects to protect critical manufacturing and agricultural communities are underway. All of the projects were thoroughly investigated by the War Production Board and the War Food Administration, the Army, or the Navy, and were undertaken only after strong recommendations by those agencies that they were needed for the war.

Since Pearl Harbor, the demands of military construction and the shortage of critical materials, equipment, and labor have forced the stoppage of numerous projects which could not command sufficiently

high priority ratings to secure the materials needed for their construction. Late in 1942 the War Production Board directed the stoppage of all Federal public works except war essential projects and since that time the general flood-control program of construction has been practically suspended but the completion of reports and plans has been continued as rapidly as practicable.

Flood disasters in this country are recognized as one of the major problems affecting the welfare and security of the entire Nation. The committee believes that it is essential to undertake the preparation of detailed plans now, in order that there will be no long period of preparation, while a few engineers compute stresses and draw plans and workers stand idle. In conformity with the President's suggestion, it is prudent to have a reservoir of worthy public works authorized and ready to be placed under construction. This suggestion will require the completion of many designs and much concentrated engineering work in the coming months.

Those who stay in this country and are suffering relatively little inconvenience in comparison with the men who are fighting, must concern themselves with the problems of employing the returning soldiers on useful and meritorious work. The existing authorized backlog of flood-control construction, although equivalent to several years of normal peacetime work is insufficient in size to meet the needs of a large post-war construction program. In fact, the existing backlog is not large enough to permit efficient and economical procedure on a purely peacetime basis. Additional authorizations for comprehensive basin plans should be made in order that the works already partially constructed in those basins shall be fully protected by the completed plans. The full benefits of these integrated basin plans will, of course, not be enjoyed until the comprehensive plans are completed as designed.

Additional authorizations for which legislation is needed, include some especially meritorious flood-control improvements. If human beings are going to live and carry on their daily activities in the fertile valleys of our rivers, their lives and property must be protected. Local inhabitants and our returning soldiers must have a sense of security if they are going to live in peace, build permanent homes, and contribute their share to the national welfare. Moreover, industry cannot afford to venture into an area where overflow is expected annually, regardless of how attractive other conditions may be.

It is impractical to prepare construction plans for flood-control projects until those projects have been authorized by Congress. It is, therefore, important that increases in authorizations be made available at this time for the major river basins where Congress has heretofore approved comprehensive plans for flood control and that the additional new projects recommended by the Chief of Engineers in reports to Congress since the enactment of the 1941 act be authorized for construction.

MODEL OF THE MISSISSIPPI RIVER BASIN

For the purpose of determining for the future the most effective method of reservoir operation for flood control in the great central basin of the United States, the Chief of Engineers, Maj. Gen. Eugene Reybold, has planned and initiated the construction of a large "reservoir operation model" near Clinton, Miss., about 9 miles west of

Jackson, Miss. The director of the United States Waterways Experiment Station at Vicksburg, Miss., is in charge of the work under the supervision of the president of the Mississippi River Commission.

The model which will be 4,500 feet by 3,500 feet will require about 200 acres, and will portray the Mississippi, Ohio, Tennessee, Missouri, Arkansas, White, and Red Rivers, and their principal tributaries embracing an area extending from the Rocky Mountains to the Appalachians and from the Canadian border to the Gulf of Mexico. Existing and proposed flood-control reservoirs, about 150 in number, as well as levees, dikes, floodways, and other pertinent flood-control works will be included in the model, in order to provide a means of studying the complexities of reservoir operation. Miniature floods of known magnitudes will be run through the model, registered by some 1,500 sensitive electrically controlled gages, and recorded at the same central control points from which the miniature reservoirs will be operated. The model will indicate relations and relative conditions, step by step, as they develop and should prove of great value in establishing full scale operation procedure for actual reservoirs at times of actual floods. Construction of this model is really a post-war project, but a certain amount of preliminary work is now being done with prisoner-of-war labor. The size and scope of this experiment by scale is without precedent, but so are the gigantic flood-control plans for the Mississippi Basin, plans that will represent an ultimate Federal investment of between one and two billions of dollars.

The experiments that have been conducted by the United States Waterways Experiment Station at Vicksburg, Miss., during the 13 years of its existence have added greatly to scientific knowledge and have saved the Government large sums of money and we agree with General Reybold in anticipating increased knowledge and savings as a result of the use of the large "reservoir operation model" near Clinton, Miss.

THE BILL

The enactment of the bill (H. R. 4485) will continue the national flood-control policy and program initiated by the act of 1936 and extended by subsequent acts of Congress, including the acts of 1937, 1938, 1939, and 1941.

The Congress and the country are agreed that the planning and execution of flood-control projects should be a function of the Corps of Engineers of the United States Army, and that the investigations of watersheds and measures for run-off and waterflow retardation and soil-erosion prevention should be prosecuted by the Department of Agriculture. The bill reaffirms this to be the policy of the United States and introduces certain modifications in administrative procedure which will aid in carrying out the flood-control program. The bill constitutes legislative planning for post-war construction.

Since the Flood Control Act of 1941, a number of reports on surveys authorized by Congress have been completed and reviewed by the Board of Engineers for Rivers and Harbors, and reports on flood-control projects with favorable recommendations have been transmitted to Congress. The plans are comprehensive in scope and contemplate the most practicable and economical method of providing flood control and, where practicable, of conserving the flood waters for beneficial uses. In each case, they have been planned with a view

to producing the greatest good to the greatest number of people. The plans include multiple-use reservoirs which will permit the development of economical hydroelectric power in addition to providing storage for flood control, irrigation, water supply, pollution control, and other purposes.

The bill provides additional authorizations for the prosecution of approved comprehensive plans and it authorizes a number of individual projects which have been found economically feasible and desirable. It continues the procedure of authorizing additional surveys and examinations for flood control and finally authorizes the sum of \$810,000,000, to be appropriated for carrying out its purposes (For details of status of authorizations, see p. 8.)

The Flood Control Committee has held hearings on all of the projects contained in H. R. 4485, Seventy-eighth Congress, second session, and has carefully considered the testimony presented. All of the projects contained in this bill have the approval of the Chief of Engineers of the United States Army.

Public hearings were conducted May 13, 1943, June 1 to 11, 1943, and are published as volume 1. Public hearings were also conducted February 1 to 23, 1944, and are published as volume 2. Both volumes are available.

ANALYSIS BY SECTIONS

SECTION 1. POLICY

Section 1 is similar to existing law, and clarifies the language contained in the Flood Control Acts of 1936 and subsequent acts to show clearly that flood control shall be construed to include channel and major drainage improvements. It reaffirms the declaration of policy respecting flood control and provides for investigation, planning, and prosecution by the Corps of Engineers of the United States Army of flood control and allied works, and investigations of watersheds and measures for run-off and water-flow retardation and soil-erosion prevention by the Department of Agriculture.

SECTION 2. LOCAL COOPERATION

Section 2 is identical with existing law. It restates the policy regarding requirements of local cooperation.

SECTION 3. RECREATIONAL FACILITIES

To date the Corps of Engineers has placed in operation some 42 dam and reservoir projects widely dispersed throughout the United States. A large number of these reservoirs present opportunities for recreational development of widespread interest and benefit, at very little cost. At the present time there is no authority to expend the small amounts of funds needed to make the recreation and conservation values at these reservoirs fully available. This committee is of the opinion that where practicable, without reducing flood-control benefits, projects should be fully utilized to provide recreational facilities for the benefit of the general public.

Section 3 authorizes the Chief of Engineers to construct, maintain, and operate recreation and conservation facilities, or to permit the

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construction, maintenance or operation of such facilities and it would authorize the Secretary of War to grant leases of lands, structures, or facilities in the reservoir areas for such periods and upon such terms as he may deem reasonable. Existing law, applicable to flood-control works, limits the period of the lease of physical property to a maximum of 5 years. The committee feels that such a limitation on the length of leases for the development of recreational areas at flood-control reservoirs would not be in the public interest and recommends the removal of this restriction with respect to leases of Federal property at reservoirs for recreational facilities. This section also provides that all moneys received for such leases or privileges shall be deposited in the Treasury of the United States as miscellaneous receipts.

SECTION 4. SALE OF STORED WATER

Recently in the development of plans for reservoirs, there have been several requests for the purchase of water for municipal and industrial purposes. Under existing law, the War Department is authorized to modify plans for any reservoir authorized by Congress to provide additional storage capacity for domestic water supply or other conservation storage provided that the cost of such increased storage is contributed by local agencies. In several cases small communities have experienced difficulty in providing the large lump-sum contributions prior to construction required by existing law, and have expressed a desire to purchase stored water at a unit price per million gallons. In several other cases requests have been received for the purchase of stored water after a dam and reservoir project has been completed. The committee, believing that full beneficial use should be made of all Federal projects, is of the opinion that the Secretary of War should be authorized to sell to States, municipalities, private concerns, or individuals at such prices and on such terms as he may deem reasonable, surplus water that may be available at any reservoir under the control of the War Department.

Suitable language has been written into the bill to accomplish this purpose; all moneys received from such sales to be deposited in the Treasury of the United States as miscellaneous receipts.

OPERATION OF MULTIPLE-PURPOSE RESERVOIRS

SECTION 5. RESPONSIBILITY FOR OPERATION OF FLOOD CONTROL AND NAVIGATION STORAGE

The committee believes that recent experiences in the operation of multiple-purpose reservoirs during major floods has demonstrated that to assure the expected flood-control benefits, reservoirs constructed wholly or in part with Federal funds provided on the basis of flood control benefits should have their flood-control features operated under the supervision of the Chief of Engineers in accordance with regulations prescribed by the Secretary of War.

The bill, therefore, provides that it shall be the duty of the Secretary of War to prescribe regulations for the use of storage available for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds provided on the basis of such purposes and requires that the operation of any such project shall be in accordance with such regulations.

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SECTION 6. RESPONSIBILITY FOR OPERATION OF IRRIGATION STORAGE

The construction of multiple-purpose reservoirs is in the public interest. Sound public policy requires not only that flood-control storage be under the supervision of the Secretary of War and the Chief of Engineers but also that storage for the reclamation of arid lands be under the supervision of the Secretary of the Interior.

The committee recognizes that good administration demands that projects be built by the agency having the dominant interest with suitable provisions for safeguarding the interests of other agencies. Accordingly, the bill provides that whenever in the opinion of the Secretary of War and the Chief of Engineers any dam and reservoir project operated under the direction of the Secretary of War can be consistently used for reclamation of arid lands, it shall be the duty of the Secretary of the Interior to prescribe regulations for the use of the storage available for such purposes, and the operation of any such project shall be in accordance with such regulation. Such amounts as the Secretary of the Interior may deem reasonable shall be charged for the use of such stored water; the moneys received to be deposited into the Treasury to the credit of miscellaneous receipts.

SECTION 7. AUTHORIZATION

Section 7 adopts and authorizes the following improvements, as set forth in the bill, for post-war construction with provisions for the preparation of necessary plans, specifications, and preliminary work during the war.

CONNECTICUT RIVER BASIN

(H. Doc. No. 412, 74th Cong.; H. Doc. No. 455, 75th Cong.; H. Doc. Nos. 653 and 724, 76th Cong.)

Connecticut River floods of 1927 and 1936 caused direct damages estimated at \$60,000,000, drastic depreciation in property values, shut-downs of industrial plants, widespread distress, and loss of lives in four New England States. With a view to relieving flood hazards in this valley, Congress, by the act of June 22, 1936, authorized a number of flood-control projects, and in the act of June 28, 1938, approved a general comprehensive plan for flood control and other purposes for the Connecticut River Basin. The flood of September 1938 indicated the desirability of making certain modifications in the approved plan, and the Flood Control Act approved August 18, 1941, incorporated those modifications in that plan. Public Law 759, Seventy-seventh Congress, second session, authorized the construction of the Gully Brook conduit at Hartford, Conn., as a desirable modification to the Hartford project.

The modified comprehensive plan provides for the construction of 20 reservoirs and 10 local protection projects. The Birch Hill and Knightville Reservoirs in Massachusetts, and the Surry Mountain Reservoir in New Hampshire have been completed except for minor work which has been deferred during the war. Local protection projects at Northampton, Springfield, and West Springfield, Mass., and East Hartford, Conn., have been completed, except for some minor work at Springfield and for foundation treatment of a portion of the dike at West Springfield. The project at Chicopee, Mass., is

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about 85 percent complete, with a short section of dike and a putnapping station still to be completed. The latter work has been deferred during the war. The north unit of the Holyoke project is complete, while the south unit has been deferred during the war.

The Hartford project is about 90 percent complete, with portions of the pumping stations still to be completed. Plans and specifications are nearing completion for the Tully Reservoir in Massachusetts and the Union Village Reservoir in Vermont; and they are under way for the Claremont and Williamsville Reservoirs in New Hampshire and Vermont, respectively; and for local protection works at Springdale and Riverdale, Mass., and at Winsted, Conn.

Sufficient authority is available for the completion of the local protection works contained in the approved plan. However, approximately \$33,200,000 of additional authorization will be required to complete the system of reservoirs, based on pre-war cost estimates. The bill proposes an increase in authorization of \$30,000,000, so that additional reservoirs can be initiated in the period immediately following the cessation of hostilities. Recognizing that Vermont does not desire a large reservoir for multiple-purpose use on the West River, the bill contains a proviso that neither the proposed authorization nor previous authorizations shall be construed to authorize the construction of a high dam at the Williamsville site.

THAMES RIVER BASIN

(H. Doc. No. 885, 76th Cong., 3d sess.)

The Thames River Basin has suffered severe flood damages, the most recent of which occurred in 1936 and 1938. The damages from these two floods were estimated at \$19,000,000. In order to reduce the flood hazard in this valley, Congress, by the act of August 18, 1941, authorized a comprehensive plan for flood control in the Thames River Basin at an estimated cost to the United States of \$13,200,000, and authorized \$6,000,000 for the initiation and partial accomplishment of this plan. The approved plan consists of seven reservoirs supplemented by local channel improvement at Norwich, Conn. Funds have been allotted for the preparation of construction drawings and specifications for the Norwich Channel improvement and for the Mansfield Hollow Reservoir in Connecticut and that work is under way.

The bill proposes authorization for the completion of the approved plan in the estimated additional amount of \$7,200,000. This will enable the Corps of Engineers to prepare designs and specifications for the entire comprehensive plan and to initiate construction on all of those projects promptly in the post-war period.

HOUSATONIC RIVER BASIN

(H. Doc. No. 338, 77th Cong., 1st sess.)

The Housatonic River watershed comprises 1,945 square miles in western Massachusetts and Connecticut and the extreme eastern part of New York. Major floods have occurred in the basin nine times since 1869, the most recent occurrences being in March 1936 and September 1938, with damages estimated at \$1,096,000 and \$2,309,000, respectively. The area contains important industrial centers manu-

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facturing metal and rubber products, machinery, textiles, and clothing, and includes many industries engaged in war work.

The plan recommended by the Chief of Engineers to control floods in this basin provides for the construction of a reservoir on the Naugatuck River about 1.1 miles above Thomaston, Conn., at an estimated cost of \$5,151,000. The reservoir will have a storage capacity of 41,500 acre-feet and would control the run-off from a drainage area of 97 square miles which is 57 percent of the drainage area above Waterbury, Conn., the principal damage center in the basin. The project will eliminate 97 percent of the damage sustained at Waterbury during a recurrence of the worst flood of record. In addition, there will be unevaluated benefits, including protection of lives, elimination of interruption to industrial pursuits, and enhancement in property value.

The committee notes that the tangible benefits exceed the cost and that in addition there are intangible benefits which, though not susceptible to evaluation affect the lives and security of the residents in this area, and accordingly recommends that this project be adopted as proposed by the Chief of Engineers.

SUSQUEHANNA RIVER BASIN

(H. Doc. No. 702, 77th Cong., 2d sess.)

The Susquehanna River is formed by the confluence of its north and west branches near Sunbury, Pa., and flows southeasterly 123 miles to the head of Chesapeake Bay at Havre de Grace, Md. It drains a generally rugged and mountainous area of 27,500 square miles lying in south central New York, central Pennsylvania, and northeast Maryland.

Floods cause great damage to property and improvements throughout the basin. Those of most recent occurrence include the flood of 1935 which caused damage estimated at \$33,000,000 in the upper watershed of North Branch and the great flood of 1936 which caused damage estimated at \$67,000,000 throughout the entire basin. In order to relieve the flood hazard in this basin, Congress, in the Flood Control Act of June 22, 1936, authorized a general plan consisting of 7 detention reservoirs and dikes and channel improvements to protect 13 towns in southern New York and eastern Pennsylvania. In addition, that act authorized individual local protection projects at 16 other localities throughout the Susquehanna Basin. The Flood Control Act approved August 18, 1941, modified the previous authorization for the Sunbury, Pa., project and the general plan for southern New York and eastern Pennsylvania to include the Lackawanna River.

Pursuant to these authorizations, the War Department has constructed the reservoirs at Whitney Point and Arkport, N. Y., and has completed plans and specifications for the Almond Reservoir. The local protection project at Oxford, N. Y., has been completed, and the projects for Painted Post, Avoca, Binghamton, Corning, and Hornell are substantially complete. The projects at Lisle and Elmira, N. Y., are 45 percent and 20 percent complete, respectively. The remaining work on the latter two projects has been deferred during the war. Detailed plans for other reservoirs and the remaining local protection works in the general plan are in preparation, in order that those projects can be placed under way when materials, equipment, and labor are again available for the construction of public works.

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With respect to the individual projects authorized in the Flood Control Act approved June 22, 1936, the works at Wilkes-Barre-Hanover township, Pennsylvania; Kingston-Edwardsville, Pa.; and York, Pa.; are substantially complete. In addition, work was in progress at Williamsport and Plymouth, Pa., but has been suspended in accordance with a directive from the War Production Board, stopping all construction on public works projects not directly essential to the war effort. Plans and specifications are in preparation for the project at Sunbury, Pa.

The plan recommended by the Chief of Engineers in House Document 702, Seventy-seventh Congress, second session, provides for modification of the general plan of improvement for southern New York and eastern Pennsylvania, as authorized by the act of June 22, 1936, to include therein reservoirs at South Plymouth and Genesetslet on tributaries of the Chenango River, at an estimated cost of \$4,755,000; modification of the project at Harrisburg, Pa., authorized by the act of June 22, 1936, to provide for the construction of levees, concrete flood walls, channel diversion, and the raising and enlarging of an existing dam, all at an estimated cost to the United States of \$2,227,000; authorization of a local protection project at Tyrone, Pa., on the Little Juniata River, Pa., consisting of levees, flood walls, channel improvement, and a pressure conduit, all at an estimated cost to the United States of \$1,392,000; and authorization for the Raystown Reservoir on the Raystown Branch of the Juniata River, Pa., for flood control, the development of hydroelectric power and other purposes, at an estimated cost of \$21,500,000.

The committee approve the modifications of existing projects as recommended by the Chief of Engineers and they recommend authorization of the Tyrone project and approval of the plan for Raystown Reservoir with authorization of \$2,000,000 for initiation and partial accomplishment of that reservoir.

MOBILE RIVER BASIN—ALABAMA-COOSA RIVER BASIN

ALLATOONA RESERVOIR, ETOWAH RIVER, GA.

(H. Doc. No. 674, 76th Cong., 3d sess.)

The Etowah and Oostanaula Rivers join at Rome, Ga., to form the Coosa River. The upper Coosa Basin, including the valley of the Etowah, is primarily an agricultural area, but due to its location and natural resources, it is becoming of increasing industrial importance. Production of textile, steel, and chemical products is expanding as a result of the war program. A serious flood situation exists at Rome where the business section and most of the residential section are subject to recurring overflows. Although a part of the residential section has been given partial protection by levees under authority of the Flood Control Act of 1936, these works will not protect against major floods and they afford no protection to the basin generally.

The plan approved in the 1941 Flood Control Act provides for construction of a reservoir at the Allatoona site on the Etowah River, 38 miles above Rome for flood control, regulation of stream flow, and power development. The authorized dam will provide practically complete protection between the site and Rome, will protect Rome against all but the most infrequent major floods, will reduce flood

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damages on the Coosa River below Rome, will be of substantial value to further navigation development, and will provide a large block of economical hydroelectric power which can be quickly absorbed by the expanding industrial requirements of the region. The project was approved by the act approved August 18, 1941, and \$3,000,000 was authorized for its initiation and partial accomplishment.

In late 1941 the War Production Board requested immediate construction of Allatoona Dam to produce power for the war activities in the area and Congress appropriated funds, but before work was actually begun, a change of program caused the project to be deferred. The field investigations preparatory to actual construction have been completed and the plans and specifications for the entire Allatoona project, including power generating facilities, are nearly complete. The committee reaffirms its approval of the Allatoona Reservoir and recommends additional authorization for completion of the project in the estimated amount of \$14,400,000.

LOWER MISSISSIPPI RIVER BASIN

(H. Doc. No. 509, 78th Cong., 2d sess.)

The Lower Mississippi River Basin is the alluvial valley of the Mississippi River which extends from Cape Girardeau, Mo., to the Gulf of Mexico and contains some 20,000,000 acres in the States of Missouri, Illinois, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. A Federal project for flood control of the Mississippi River in its alluvial valley and for its improvement from the Head of Passes to Cape Girardeau, Mo., was adopted by the Flood Control Act approved May 15, 1928, and has been amended and extended by subsequent acts of Congress. The authorized navigation channel between Baton Rouge, La., and Cairo, Ill., is not less than 9 feet in depth and 300 feet in width. Below Baton Rouge the channel is not less than 35 feet in depth and 500 feet in width. Flood control of the lower Mississippi River and its improvement for navigation are inseparable since much of the work prosecuted under the authorized project serves both purposes and no specific work for either flood control or navigation is undertaken without carefully analyzing its effect on both phases of the project.

In the spring of 1943, the Committee on Commerce of the Senate and this committee adopted resolutions requesting the Chief of Engineers to review the navigation provisions of the project for the improvement of the Mississippi River adopted by the act of May 15, 1928, as amended, with a view to determining the advisability, in the interest of navigation and flood control, of increasing the depth of the navigation channel from 9 feet to 12 feet between Cairo, Ill., and Baton Rouge, La. A report in response to these resolutions has been prepared by the Mississippi River Commission, concurred in by the Chief of Engineers, and transmitted to Congress by the Secretary of War.

The report quotes the following statement from House Document No. 90, Seventieth Congress, which was enacted into law by the act of May 15, 1928, and which is as sound today as when written.

131. Channel stabilization. Since the levees within the limits of this project are to be greatly enlarged, they will be much more expensive than heretofore,

so something must be done to avoid the frequent moving of them from the proximity of caving banks. In addition, the river cannot be regulated for low-water navigation until the banks are made stable, this both to keep the channel in one place and to stop the enormous dumping of earth into the river by bank caving. A general bank protection scheme must be carried out * * *.

The Mississippi River Commission says that, with the great Mississippi River levee system rapidly approaching completion, the control of the meander of the river has become the most urgent and difficult problem confronting those responsible for the safety of the valley and the maintenance of free, easy, and unobstructed navigation channels below Cairo. Stabilization of banks will reduce the sand in motion, will fix the locations of crossings, and will reduce the amount of dredging required to maintain the navigation channel. It is estimated that the existing authorization for maintenance dredging will be ample to secure a minimum low-water depth of 12 feet after stabilization work is completed. A certain amount of improvement dredging and low dikes will be required to produce the best alinement and to fix the low-water channel in certain reaches before bank stabilization is undertaken.

The report concludes that the time has now arrived in the development of the alluvial valley of the Mississippi for undertaking to hold the river's meander within narrow limits as rapidly as funds can be made available; that stabilization of the river is necessary in order to retain reduction in flood heights obtained by channel rectification, and is advisable for the purpose of safeguarding the main Mississippi River levees; and that such stabilization may materially increase the flood-carrying capacity of the river as well as provide a minimum depth of 12 feet at low water for navigation. The estimated cost of the plan of improvement is \$200,000,000, of which about four-fifths would be required for bank stabilization and one-fifth for improvement dredging and low dikes. It is estimated that the work would extend over a period of years.

The Chief of Engineers concurs with the Mississippi River Commission and recommends that the existing project for flood control, Mississippi River and tributaries, be modified to authorize a navigation channel 12 feet deep and 300 feet wide at low water between Cairo, Ill., and Baton Rouge, La., and the execution, in the interest of navigation and flood control of a channel improvement and stabilization program at an estimated cost, over that now authorized, of \$200,000,000.

The committee believes that the great investments made by the local people and the Government in the levee system; the constantly increasing population and property values protected by the levees; and the benefits accruing to the country as a whole from the navigation of the river, amply justify the further expenditures required and it recommends modification of the existing project in accordance with the recommendations of the Chief of Engineers, at an estimated additional cost of \$200,000,000.

BOEUF AND TENSAS RIVER BASIN

(S. Doc. No. 151, 78th Cong., 2d sess.)

The Boeuf and Tensas Rivers and Bayou Macon are located in Arkansas and Louisiana and embrace that part of the alluvial valley of the Mississippi River lying south of the Arkansas River, west of the

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Mississippi River, north of the Red River backwater area, and east of the Opachita River and Bayou Bartholomew. This area has been protected against Mississippi River floods by the levees and other works constructed under the Flood Control Act approved May 15, 1928, as amended. However, the area is subject to overflow from the above-named streams since their channels are obstructed with debris and undergrowth and are inadequate to discharge headwater run-off. Furthermore, local interests have constructed drainage ditches into the upper end of the basin, thus increasing the total inflow into the basin without improving the conditions of outflow. It is estimated that channel improvements of the main streams in the basin will wholly or partially eliminate the flooding now suffered.

The Chief of Engineers has investigated this situation, in response to a resolution of the Committee on Commerce of the Senate, and he concurs in the recommendation of the Mississippi River Commission that the improvements recommended for the channels of these streams should be undertaken at an estimated cost of \$5,013,000.

The committee followed the recommendation of the report and included authorization for this work in the bill.

YAZOO RIVER BASIN

(H. Doc. No. 516, 78th Cong., 2d sess.)

The Big Sunflower, Little Sunflower, Hushpuckena, and Quiver Rivers, and Hull Brake-Mill Creek Canal, Bogue Phalia, Ditchlow Bayou, Deer Creek, and Steele Bayou are all tributaries of the Yazoo River, which enters the lower Mississippi River near Vicksburg, Miss. Prior to the development of the Mississippi River levee system, the area drained by these streams was subject to overflow. The construction of Mississippi River levees under the act of May 15, 1928, now gives protection against Mississippi River floods and the completion of the Yazoo headwater project and the Yazoo backwater project will give protection to most of the area against Yazoo River floods and Mississippi River backwater. However the area will remain subject to flood damage due to the inadequate capacities of the local streams which have become obstructed with undergrowth and debris. Conditions on these streams are similar to those existing on the Boeuf and Tensas Rivers and Bayou Macon, discussed in the preceding item.

The Chief of Engineers has investigated this situation in response to a resolution of the committee and he concurs in the recommendation of the president of the Mississippi River Commission that channel improvements on the streams named be undertaken to remedy this flood situation at an estimated cost of \$3,752,000.

The committee followed the recommendation of the report of the Chief of Engineers and included this item in the bill.

YAZOO BACKWATER AREA

(H. Doc. No. 359, 77th Cong., 1st sess.)

A project for the protection of the Yazoo backwater area was recommended in House Document No. 359, Seventy-seventh Congress, first session, and authorized in the Flood Control Act approved August 18, 1941. It involves the construction of a levee from the lower end

of the Mississippi River levee above Vicksburg northward along the west bank of the Yazoo River to a connection in the vicinity of Yazoo City with the Yazoo River levee authorized by the existing project for protection against headwater floods of the Yazoo River system. The authorization in the 1941 act permitted adjustment in the discretion of the Chief of Engineers of the grades of existing levees in the backwater area on the east bank of the Yazoo River. However, there is a large area on the east bank of the Yazoo River below Satartia that does not have existing levees, for which protection was not provided by the 1941 act and on which floods may be increased by construction of the authorized backwater levee. In response to questions asked by the committee, the president of the Mississippi River Commission gave the factual data with respect to the acreage in this area that could be protected and the estimated cost of providing protection. A study of these data shows that if the Satartia area or the Satartia area plus its extension is given protection by works constructed as a part of the authorized Yazoo backwater project, the ratio of benefits to costs would be favorable and the cost per acre for the entire improvement would be substantially less than the unit costs of similar backwater protection that has been authorized elsewhere in the alluvial valley of the Mississippi River.

The committee, has therefore, included an item in the bill amending the backwater project as authorized by the Flood Control Act of 1941, to authorize the Chief of Engineers, in his discretion, to include improvements for the protection of the Satartia area at an estimated additional cost of \$1,061,000, or, in his discretion, to include improvements for the protection of the Satartia area plus its extension at an estimated cost of \$1,952,000.

RED-OUACHITA RIVER BASIN

LITTLE MISSOURI RIVER, ARK.

(H. Doc. No. 837, 76th Cong., 3d sess.)

The Little Missouri River rises in Polk County, Ark., in the southern slopes of the Missouri Mountains, flows generally southeast for a distance of 147 miles and enters the Ouachita River 28 miles above Camden, Ark. Large floods which occur at comparatively frequent intervals adversely affect the agricultural activities of the inhabitants of this basin, consisting of general farming and fruit culture, as well as the industrial activities, which include sawmills, cotton gins, preparation and processing of fruits, and some mineral and petroleum production. For the protection and improvement of this watershed, the Congress has adopted a project consisting of the construction of the Narrows Reservoir and powerhouse and improvement of channels of Little Missouri River, Terre Noire Creek, Ozan Creek, and for the repair of levees along Terre Noire Creek, at an estimated first cost to the United States of \$6,800,000 and authorized the appropriation of \$3,000,000 for the initiation and partial accomplishment of that plan. The bill proposes an additional authorization for the completion of the plan at an estimated cost of \$3,800,000.

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(Flood Control Committee Doc. No. 1, 75th Cong., H. Doc. No. 717, 77th Cong., 2d sess., and H. Doc. No. 186, 78th Cong., 1st sess.)

Destructive floods occur in almost all parts of this extensive basin and flood flows from the Arkansas River contribute largely to floods in the lower Mississippi Valley. The flood in May and June of 1943, inundated some 1,500,000 acres and caused direct damages estimated at \$33,000,000. Twenty-three lives were lost. The storms causing this flood began on May 7, 1943, and continued, with a pause between May 11 and May 14, until May 20, 1943. They centered near Webbers Falls, Okla., with 13.64 inches of precipitation for the first phase and near Joplin, Mo., with 16.41 inches total precipitation for the second phase.

Congress, in the Flood Control Act of 1936, authorized a number of reservoirs and local flood-protection works for the Arkansas River Basin and by the Flood Control Act of 1938 approved a general comprehensive plan for flood control and other purposes and authorized \$21,000,000 for initiation and partial accomplishment of the work. That plan was modified and extended by the Flood Control Act approved August 18, 1941, which authorized an additional \$29,000,000 for the prosecution of the approved plan.

Pursuant to these authorizations, the War Department has completed Conchas Dam and Reservoir on the South Canadian River in New Mexico, the Fort Supply Dam and Reservoir on the North Canadian River in Oklahoma, the Great Salt Plains Reservoir on the Salt Fork of the Arkansas River in Oklahoma, and the Nimrod Reservoir in Arkansas, and it has initiated construction on three reservoirs; namely, the Blue Mountain Reservoir on the Petit Jean River in Arkansas, the Canton Reservoir on the North Canadian River in Oklahoma, and the John Martin Reservoir on the Arkansas River in Colorado. The Blue Mountain, Canton, and John Martin Reservoirs were substantially 73 percent, 20 percent, and 90 percent complete, respectively, when further work on those projects was suspended, in accordance with a directive of the War Production Board. The John Martin Reservoir, however, is in partial operation. Detailed plans for other reservoirs in the approved plan and for a number of local protection projects authorized in the various flood-control acts are in preparation in order that those projects can be placed under way when the present restrictions on Federal public works have been lifted.

The increased activities in eastern Oklahoma and southeastern Kansas resulting from the expanding war industries in that area, emphasize the need for providing adequate flood control in the Arkansas River Basin at the earliest practicable date. Accordingly, the bill provides an additional authorization of \$35,000,000 for the prosecution of the comprehensive plan.

ARKANSAS RIVER, MAIN STEM FROM GREAT BEND, KANS., TO PINE BLUFF, ARK.

(H. Doc. No. 447, 78th Cong., 2d sess.)

Following the destructive floods along the Arkansas River in May and June of 1943, the Flood Control Committee adopted a resolution requesting the Board of Engineers for Rivers and Harbors to review

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the previous reports on the Arkansas River, with a view to determining whether any modifications should be made therein at this time with respect to local flood protection along the main stem of the Arkansas River.

The report of the Board of Engineers for Rivers and Harbors and of the Chief of Engineers, in response to that resolution has been submitted to the Congress and has been carefully considered by this committee. The report recommends the following local works of improvement for flood control along the main stem of the Arkansas River:

Modifications of the following projects:	<i>Additional estimated cost to the United States</i>
Tulsa and West Tulsa, authorized by the act approved Aug. 18, 1941.....	\$133, 000
Near Fort Gibson, Okla., authorized by the act approved June 22, 1936.....	260, 100
Crawford County levee district in Arkansas, authorized by the act approved Aug. 18, 1941.....	1, 546, 000
Near Dardanelle, Ark., authorized by the act approved June 22, 1936.....	122, 500
West of Morrilton, Ark., authorized by the act approved June 22, 1936.....	855, 000
Little Rock, Ark., authorized by the act approved June 22, 1936.....	465, 200
South bank of the Arkansas River between Little Rock and Pine Bluff, authorized by the act approved Aug. 18, 1941.....	790, 000
Total.....	4, 171, 800
Construction of projects at the following localities:	<i>Estimated cost to the United States</i>
Jenks, Okla.....	\$264, 000
Dirty Creek Bottom area, Oklahoma.....	421, 000
Tucker Lake Bottom area, Oklahoma.....	485, 000
Braden Bottom area, Oklahoma.....	192, 000
Big Skin Bayou-Camp Creek Bottom area, Oklahoma.....	349, 000
Moffett Bottom area, Oklahoma.....	957, 000
Fort Smith, Ark.....	898, 600
Van Buren, Ark.....	329, 000
McLean Bottom levee district No. 3, Arkansas.....	517, 000
Arkansas River, Conway County levee district No. 6, Arkansas.....	371, 000
Conway County levee districts Nos. 1, 2, and 8, Arkansas.....	1, 005, 000
Roland drainage district, Arkansas.....	339, 000
Total.....	6, 127, 600
Grand total.....	10, 299, 400

In the interest of preventing flood losses and insuring the welfare of the people residing in this area, the committee recommends that these projects be adopted at an estimated additional cost to the United States of \$10,299,400.

FOUNTAIN QUE BOUILLE RIVER

(H. Doc. No. 186, 78th Cong., 1st sess.)

The Fontaine Que Bouille (Fountain) River is formed at Colorado Springs, Colo., by the confluence of Fountain and Monument Creeks and flows 52 miles in a meandering southwesterly direction to join the Arkansas River at Pueblo, Colo., about 1,280 miles upstream from the mouth of the latter. Colorado Springs, with a population of 33,237, is the largest city lying wholly within the basin and is one of the

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principal damage centers in the basin. That portion of Colorado Springs and its suburbs in the overflow area of Monument Creek and Fountain River comprises an area of 670 acres, of which 505 acres are occupied by railway tracks and yards, athletic stadiums, churches, residences, and small business and industrial establishments. Another area overflowed by storm run-off extends from the mouth of Templeton Gap to the confluence of Shooks Run with the Fountain River and comprises an area of 1,100 acres, of which about 400 acres are within the limits of Colorado Springs and the adjacent community of Papeton, while the remaining 700 acres are largely agricultural lands lying outside of the developed area of these two communities. Ten major floods have been reported in the past 76 years. The most severe flood on Templeton Gap occurred in July of 1932 and caused property damage estimated at \$145,800.

The Chief of Engineers has investigated the flood situation in the Fountain River Basin in response to an authorization contained in the 1937 Flood Control Act and he has submitted his report to Congress. He finds that protection can be provided at Colorado Springs, Colo., against a flood 45 percent greater than the maximum of record by the construction of a paved floodway from the outlet of the Gap to Monument Creek at a point just upstream from the Chicago, Rock Island, & Pacific Railroad bridge. The estimated cost of the project to the United States is \$500,000.

The committee believes that the intangible benefits resulting from the correction of this menace, in addition to the tangible benefits are sufficient to justify the construction of the project and has, therefore, included in the bill authorization for this work.

PURGATOIRE (PICKET WIRE) RIVER, COLO.

(H. Doc. No. 387, 78th Cong., 2d sess.)

Purgatoire River is formed by the confluence of its North and Middle Forks in the Culebra Range of the Rocky Mountains in southeastern Colorado and flows 186 miles northeasterly to enter the Arkansas River 3 miles east of Las Animas, Colo. Floods occur at irregular intervals in different sections of the basin usually as a result of storms in the watershed. They cause damage to railroad property, residences, parks, business and industrial establishments, streets, sewers, and public utilities, all in the city of Trinidad estimated to average \$29,650 annually in addition to damages to crops, farm improvements, roads, bridges, and irrigation structures in the rural areas upstream from the canyon section.

The Chief of Engineers has investigated the flood problem in this area in accordance with the provisions of the Flood Control Acts approved June 22, 1936, and June 28, 1938. He finds that flood protection by reservoirs cannot be afforded in the main valley at a cost commensurate with the benefits to be expected. He concludes, however, that local protection works in the city of Trinidad are warranted and he recommends the construction of channel and levee works throughout the city at an estimated cost to the United States of \$909,000.

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WHITE RIVER BASIN

Congress, in the Flood Control Act of 1936, recognized the seriousness of the flood problem in the White River Basin and authorized local protection works for nine localities in the basin. Four of these local protection projects built prior to the flood of May and June of 1943 functioned as designed during that flood, protecting the city of Newport, Ark., and important agricultural areas. The Flood Control Act of 1938 approved a general comprehensive plan for the White River Basin, in accordance with the recommendation of the Chief of Engineers and authorized \$25,000,000 for the initiation and partial accomplishment of the reservoirs of that plan. The Flood Control Act approved August 18, 1941, modified and extended the comprehensive plan and authorized an additional \$24,000,000 for continuation of work under the approved plan.

Pursuant to these authorizations, a multiple-purpose flood control and hydroelectric power development on the North Fork of White River at Norfork, Ark., is nearing completion under rush orders to provide power for important war industries and will be completed this spring. Clearwater Dam on the Black River was initiated but has been stopped in accordance with a directive from the War Production Board. In addition to the actual construction, plans and specifications are in preparation for the Water Valley, Bull Shoals, Table Rock, and Greers Ferry Reservoirs.

The present bill proposes an additional authorization of \$45,000,000 in order that work on the comprehensive plan may be resumed on an effective scale in the period immediately following the cessation of hostilities.

UPPER MISSISSIPPI RIVER BASIN

The upper Mississippi River Basin is that part of the watershed of the Mississippi River lying above Cape Girardeau, Mo., exclusive of the Missouri River Basin.

The basin has been subjected to destructive floods at frequent intervals and extensive damages have been caused along the main Mississippi River and along the Meramec, Kaskaskia, Illinois, Sangamon, and other tributary rivers, the most recent of which occurred in May and June of 1943, when 465,000 acres of land were inundated causing damage estimated at \$27,500,000. Fifteen lives were reported lost during this flood, alone. The most serious floods in the upper Mississippi Valley Basin generally occur during the months of April, May, and June.

The Flood Control Act of 1936 authorized the improvement of existing local flood-protection works at 26 levees and drainage districts along the upper Mississippi River, 32 localities along the Illinois and Sangamon Rivers, 2 localities on the Kankakee River, and at 3 localities on the Rock River. Two reservoirs for local flood control were also authorized, one on the Minnesota River and one on a tributary of the upper Iowa River. The authorization for the reservoir on the upper Iowa River was later modified to provide for the diversion of Dry Run and the construction of a system of levees. The 1938 Flood Control Act approved a general comprehensive plan for flood control in the upper Mississippi River Basin, consisting of the construction of 10 reservoirs supplemented by local protection works at 13 localities.

on the upper Mississippi, Illinois, Sangamon, and Kaskaskia Rivers. For the initiation and partial accomplishment of this work, the Congress authorized an appropriation of \$2,700,000 for local protection works and \$6,600,000 for reservoirs.

Eight of the local protection projects authorized by the 1936 act and six of the local protection projects contained in the comprehensive plan, have been completed. Several others are partially completed. Work on these projects has been deferred in accordance with a directive from the War Production Board. Plans and specifications are in preparation for the Meramec, Big River, and Coralville Reservoirs, and for additional local protection projects.

The present bill proposes an additional authorization of \$10,000,000, in order that work may be resumed promptly and effectively upon the cessation of hostilities or earlier if practicable.

STE. GENEVIEVE LEVEE DISTRICT

(H. Doc. No. 727, 77th Cong., 1st sess.)

The Flood Control Act approved June 22, 1936, authorized a project for flood control in the Ste. Genevieve levee district No. 1, Missouri, consisting of the raising and enlarging of the existing levee system to improve the existing protection at that locality. This project has not yet been undertaken. On May 16, 1942, the Secretary of War transmitted to Congress the report of the Chief of Engineers recommending modification of the existing project to provide for the protection of Ste. Genevieve levee district No. 1 and an adjacent area known as the Common Big Field by the construction of a levee and appurtenant works, at a total estimated cost to the United States of \$141,000.

The area under consideration, consisting of both levee district No. 1, and the Common Big Field, includes approximately 3,200 acres of highly developed agricultural land lying between the Mississippi River and its bluff, in addition to approximately 100 acres occupied by a railroad, roads, and buildings. The committee notes that the benefits expected to accrue from the project exceed the cost by a ratio of slightly better than 2 to 1, and it recommends that the project be adopted by Congress.

MISSISSIPPI RIVER AT SABULA, IOWA

(H. Doc. No. 328, 77th Cong., 1st sess.)

The eastern half of Sabula is on high ground immediately adjacent to the main Mississippi River channel and is not subject to flooding, but in its natural state, the westerly half was subject to inundation by floodwaters entering the village from the low swale west of the town. To protect this area local interests constructed a levee extending from the north end of town in a northwesterly direction to high ground at the Iowa Bluff and a second levee extending from the south end of town following an old railroad fill in a southwesterly direction to the bluff line. These two levees protect the town against floods of the magnitude of that of 1938, but would not protect against the largest floods of past record. In their present condition, the levees are subject to the erosive action of floodwaters and may fail unless protected.

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Remedial measures recommended by the Chief of Engineers for the protection of the local levee at Sabula, Iowa, consist of riprapping at critical points as outlined in House Document No. 328 (77th Cong., 1st sess.), at an estimated cost to the United States of \$25,000.

In the opinion of the committee this work is essential and is economically justified. The committee recommends protection of existing levees at Sabula, Iowa, against erosion, in accordance with the recommendations of the Chief of Engineers.

GALENA RIVER, ILL.

(H. Doc. No. 336, 77th Cong., 1st sess.)

Galena River rises near Belmont, Lafayette County, Wis., flows south into Illinois and discharges into Harris Slough, a side channel of the Mississippi River, 565 miles above the mouth of the Ohio River. It drains an area of 207 square miles of rugged terrain, characterized by rolling uplands intersected by gorgelike valleys. The city of Galena, with a population of 4,126 is located 4 miles above the river's mouth.

The only flood problem of consequence in the basin is at the city of Galena and along the narrow strips of bottom land extending upstream about 4 miles to the mouth of the East Fork. The plan for flood protection recommended by the Chief of Engineers provides for the construction of levees and flood walls and appurtenant structures for the protection of the business and industrial sections on the west bank of the river, for the abandonment and removal of three railroad and two highway bridges, for modification of a highway bridge, and for some channel enlargement through and below the city, at an estimated cost of \$300,000.

The committee finds that a serious problem exists at Galena due to frequent floods on the lower Galena River and it recommends adoption of the project recommended by the Chief of Engineers.

ILLINOIS RIVER

(H. Doc. No. 692, 77th Cong., 2d sess.)

The Illinois River is formed by the confluence of the Des Plaines and Kankakee Rivers in northeastern Illinois and flows southwesterly 273 miles to the Mississippi River at Grafton, 38 miles above St. Louis. About 359,000 acres of land between the bluffs along the river were originally subject to overflow. Of this area, nearly 200,000 acres, below Starved Rock have been reclaimed by levees, which in general afford a high degree of protection against all but the most severe floods. Thirty-nine levee districts of importance are included in the flood plain. These range in size from 794 to nearly 13,000 acres. Opposite the Big Prairie drainage and levee district, a few miles below Beardstown, the flood channel is restricted at the narrow opening by the levees on the opposite bank of the river.

The Chief of Engineers finds that the use of the Big Prairie drainage and levee district to provide additional floodway area in the interest of flood control is desired and recommends that that district be purchased by the United States and that the levee be suitably degraded, all at an estimated cost of \$111,500.

The committee followed the recommendations of the Chief of Engineers and included this project in the bill.

22 RESERVOIRS, LEVEES, AND WALLS FOR FLOOD CONTROL**ELK CREEK AND TURKEY RIVER**

(H. Doc. No. 700, 77th Cong., 2d sess.)

Elkport lies at the junction of Elk Creek and Turkey River, 21.2 miles above its mouth in Clayton County, Iowa. The Turkey River at this point drains 1,556 square miles, including 67 square miles drained by Elk Creek. Elkport lies within the flood plains of both Turkey River and Elk Creek. Prior to the construction of a road dike at Elkport, frequent and devastating floods of Turkey River and Elk Creek inundated the town. Since completion of this dike in 1936 no flooding has occurred. A severe flood, however, would overtop this dike and cause extensive damage. Adequate protection for Elkport can be provided by raising the road dike or providing a levee on the riverward side of the road. The Chief of Engineers finds that the construction of a new levee on the riverward side of the existing road dike would be the most suitable plan of improvement for Elkport and recommends its construction, in accordance with plans set forth in House Document No. 700, Seventy-seventh Congress, second session.

The committee is of the opinion that local flood-protection measures at Elkport are warranted and recommends the adoption of the project recommended by the Chief of Engineers, at an estimated cost of \$13,000.

RED RIVER OF THE NORTH BASIN**RED LAKE RIVER AND TRIBUTARIES**

(H. Doc. 345, 78th Cong., 1st sess.)

Red Lake River, the principal tributary of the Red River of the North, has its source at the outlet of lower Red Lake in the northwestern part of Minnesota, flows generally westward through a meandering course for 196 miles, and empties into the Red River of the North at East Grand Forks, Minn. The drainage area contains 5,711 square miles, of which about 500 square miles are water surface. The principal tributary is Clearwater River, which enters from the south about 90 miles above the mouth of Red Lake River.

The Chief of Engineers has investigated the flood problem on the Red Lake River and its tributaries pursuant to the authority contained in the Flood Control Act approved June 28, 1938, and has submitted a report to Congress in which he recommends adoption of a Federal project for the regulation of Red Lake for flood control by the installation of three hand-operated Tainter gates and other appurtenant works and for the rectification, clearing, and enlarging of the channels of Red Lake River and Clearwater River, Minn., at an estimated cost to the United States of \$902,940.

The Flood Control Committee believes that the improvements outlined in the report of the Chief of Engineers would provide a reasonably satisfactory solution of the water supply problems in the Red Lake River Basin and the control of floods resulting from direct overflow from streams within the Red Lake River Basin and it recommends the authorization of the work proposed by the Chief of Engineers.

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MISSOURI RIVER BASIN

(Flood Control Committee Doc. No. 1, 75th Cong.; H. Doc. 842, 76th Cong.; H. Doc. 475, 78th Cong.)

The Missouri River is formed by the confluence of the Gallatin, Madison, and Jefferson Rivers at Three Forks, Mont., in the southwestern part of that State. It flows in a generally southeasterly direction to its junction with the Mississippi River about 17 miles above St. Louis, Mo. From the headwaters of the Missouri River to its mouth, the surrounding area changes from mountainous at the headwaters to sloping terrace lands, and finally to rolling plains near its mouth. The river has a total length of 2,470 miles and drains an area of 529,000 square miles, of which approximately 9,715 square miles are in Canada.

Destructive flooding is a constant threat to farm lands and urban property in the Republican, Kansas, and Missouri River Valleys. A severe flood occurred on the lower Missouri River in June of 1942 inundating tens of thousands of acres of fertile bottom lands and in the spring of 1943 the Missouri River experienced three severe floods, the first of which occurred in April and centered over the upper basin; the second occurred in May and June on the lower river as a part of the floods visiting the Central and Midwestern States; and the third occurred in June, reached the highest stage since 1917 at St. Joseph and generally caused the highest levels since 1903 from Kansas City to the mouth of the Osage River. The floods in 1943 inundated about 2,478,000 acres of farm land and damaged numerous towns with major damage centering at Beulah, Mont, and Mandan, N. Dak.; Fort Pierre and Pierre, S. Dak.; Council Bluffs, Iowa; and Omaha, Nebr., causing direct damage estimated at \$47,382,000. Eleven lives were reported lost during these floods. These recent floods in the Missouri River, particularly below Sioux City, are the only major floods of record in which no cut-off or no change in location of the main channel of the river occurred. This is attributable to the improvements which have been made in connection with the navigation project. The dikes constructed as part of the navigation improvements concentrate the flow into one channel in such shape that the energy of the flowing waters scours the desired channel and the banks are reveted when the desired alinement is attained. For the first time in history it appears that the channel of the Missouri River is stabilized and the construction of reservoirs and local protection works can be initiated with assurances that the works will protect the areas for which they are designed.

Congress, in the Flood Control Act approved June 28, 1938, adopted a general comprehensive plan for flood control in the Missouri River Basin, consisting of a system of nine reservoirs, at an estimated construction cost at that time of about \$145,000,000, and authorized an initial appropriation of \$9,000,000 for the partial accomplishment of that plan. The Flood Control Act approved August 18, 1941, extended the plan to include the Harlan County Reservoir on the Republican River, Nebr., and such other supplemental flood-control works on that stream as the Secretary of War and the Chief of Engineers may find advisable, and authorized the appropriation of an additional \$7,000,000 for the prosecution of the comprehensive plan. The Kanopolis Reservoir on the Smoky Hill River near Salina, Kans.,

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was selected for construction as the initial unit in the comprehensive plan. That project was approximately 65 percent complete when all work on it was suspended in accordance with a directive from the War Production Board.

Following the flood in April of 1943, the Flood Control Committee, by resolution adopted on May 13, 1943, requested the Board of Engineers for Rivers and Harbors to review the prior reports on the Missouri River, with a view to determining whether any modification should be made therein at this time with respect to flood control along the main stem of the Missouri River from Sioux City, Iowa, to its mouth. The reports of the division engineer, the Board of Engineers for Rivers and Harbors, and the Chief of Engineers in response thereto have been submitted to Congress and have been published as House Document No. 475, Seventy-eighth Congress, second session.

The Chief of Engineers recommends modification of the approved plan of the Missouri River to include 12 additional reservoirs, 5 of which are located on the main stem upstream from Sioux City, Iowa, and a system of levees along both banks of the Missouri River between Sioux City, Iowa, and the mouth. The committee has held extensive hearings on the plan recommended by the Chief of Engineers. The Governors of the 5 States in the headwater areas, the Commissioner of the Bureau of Reclamation, representatives of the Chief of Engineers of the United States Army, and representative local interests presented their views in detail to the committee. After careful consideration of the testimony presented at that hearing, and with due regard to the comments of the Bureau of the Budget on the report of the Chief of Engineers, the committee is of the opinion that the works recommended by the Chief of Engineers will form a broad framework for the comprehensive development of the entire Missouri River Basin in the interest of flood control, irrigation, power development, navigation, and other purposes and that the adjustment of the water use to meet the changing needs of the Missouri River Basin as a whole can and will be made if the comprehensive development proceeds step by step toward ultimate accomplishment. The committee, therefore, recommends that the approved comprehensive plan for the Missouri River Basin be expanded to include the work recommended by the Chief of Engineers in House Document No. 475, Seventy-eighth Congress, second session.

The committee recognizes the high value of flood protection in the Missouri River Basin and it believes that the sum of \$200,000,000 should be authorized at this time in order that detailed plans may be prepared for other reservoirs in the approved plan as expanded and modified by the work recommended by the Chief of Engineers in House Document No. 475 of the Seventy-eighth Congress, and that the additional projects that can be built under the increased authorization may be initiated as soon as the present restrictions on the public-works program are lifted. In order clearly to affirm the intention of the report of the Chief of Engineers and to reassure the residents in the upper Missouri Basin, the committee has inserted the following provisos to the item in the bill modifying and expanding the approved comprehensive plan of development in the Missouri River Basin:

Provided, That nothing in this Act shall be construed as creating below Sioux City any demand upon the water resources of the Missouri River Basin above Sioux City in excess of that now authorized by existing law: *And provided further*,

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That portions of the storage authorized for the main stem of the river shall be placed on tributaries if the Secretary of War and the Chief of Engineers find such action advisable for silt control and in order to make more water readily available for agricultural and industrial use without impairment of flood control below Sioux City and without increasing the authorized limit of cost.

THE KANSAS CITIES, KANS. AND MO.

(H. Doc. No. 342, 78th Cong., 1st sess.)

The Missouri River flows southeasterly from its source in Montana and enters the Mississippi River 17 miles above St. Louis, Mo. Just above the State line between Missouri and Kansas and 378.9 miles above its mouth, the Missouri River is joined by the Kansas River from the southwest. Big Blue River enters Missouri River from the south 10.3 miles below the mouth of the Kansas River. The Missouri and Kansas Rivers at their confluence drain 427,720, and 60,060 square miles, respectively. Big Blue River drains 286 square miles. East of the State line and on the south bank of Missouri River is located Kansas City, Mo., which contains within its limits most of the lower 19 miles of Big Blue River. The adjoining city of Kansas City, Kans., includes the lower several miles of Kansas River and borders the Missouri River on the south and west for about 6 miles upstream. North Kansas City, Mo., is on the north bank of Missouri River opposite these 2 cities. These separately incorporated municipalities with populations of about 399,180, 121,460, and 2,690, respectively, together form an important commercial and industrial center, served by 13 railroads and improved Federal and State highways.

With a view to relieving flood hazards in this important industrial and commercial center, Congress, by the act of June 22, 1936, authorized levees and flood walls to protect the people and city property at the Kansas Cities, in accordance with plans approved by the Chief of Engineers, as amended by further studies, at an estimated cost to the United States for construction of not to exceed \$10,000,000 and an estimated cost of \$8,000,000 for lands and damages to be borne by local interests. The general plan of improvement provides for the construction of levees and flood walls as project units at Argentine, Armourdale, Central Industrial, Fairfax-Jersey Creek, North Kansas City, and East Bottoms; for channel improvement of the Kansas River; for bridge and approach alterations on the Kansas River; and for channel and floodway improvement along the Missouri River. A considerable portion of the work on the Fairfax-Jersey Creek unit and some channel improvement in the Kansas River have been undertaken.

Further studies disclose the advisability of including in the plan a cut-off in the Missouri River at Liberty Bend below the Kansas Cities between miles 357 and 363.7, as this would reduce flood stages and improve the alinement for navigation. The Liberty Bend cut-off, as designed, will reduce the cost of flood protection at the Kansas Cities. Without the cut-off, adequate flood protection at the Kansas Cities cannot be obtained except by encroachment of protective structures upon the Municipal Airport of Kansas City, Mo., with a resultant reduction in its usable area and a disruption of existing airport facilities. Many important industries and facilities lie within the area to be protected, including two airports, one of which is utilized by the Army Air Corps, the Naval Reserve, and the Marine Reserve; defense training schools; a large assembly plant for military aircraft; important stockyards and packing plants; a number of grain storage and

flour milling facilities; vital portions of the important transportation network converging at the Kansas Citys, together with their shops, yards, and other facilities. Furthermore, the proposed cut-off will be beneficial to the lower portions of the Big Blue River Valley and other urban localities.

The Chief of Engineers recommends that the existing project for flood control at the Kansas Citys, which was initiated pursuant to the authority contained in the Flood Control Act of 1936, be modified in accordance with the plan presented in House Document No. 342, Seventy-eighth Congress, first session, including protection for the Union Wire Rope Co. plant on Big Blue River; higher levee grades at the individual levee units contained in the original plan; construction of the Liberty Bend cut-off and protection for the Birmingham district, all at an additional estimated cost of \$8,445,000. The committee concurs in this recommendation.

CHERRY CREEK AND TRIBUTARIES, COLORADO

(H. Doc. No. 426, 76th Cong., 1st sess.)

In the Flood Control Act approved August 18, 1941, and in its report on that bill, the committee recognized the possibility of a major flood on Cherry Creek threatening the city of Denver, Colo., with a major catastrophe. Cherry Creek rises in El Paso County, Colo., flows northerly to join the South Platte River in Denver. The topography of Cherry Creek Basin is such as to cause large floods of great intensity and may descend on Denver with little warning. For the lower 5½ miles of the course, Cherry Creek flows through industrial and residential sections of the city. The great flows which would result from major floods on Cherry Creek would submerge a large part of the central portion of Denver, including important business districts, railroad yards and industrial establishments, and extensive residential areas. Denver is the most important industrial center between the Missouri River and the Pacific coast, and any disruption of the normal activities of that city would be detrimental to the whole country.

With a view to removing the threatened hazard to the city of Denver, Congress in the Flood Control Act of 1941 adopted the project recommended by the Chief of Engineers in House Document No. 426, Seventy-sixth Congress, first session, at an estimated cost of \$10,500,000 and authorized the appropriation of \$3,000,000 for the initiation of that plan. Under this authorization, a large portion of the detailed plans and preliminary work required prior to the initiation of actual construction has been completed, and the committee has included the authorization of \$7,500,000 in this bill in order that the project may be carried to completion in the post-war period.

KNIFE RIVER BASIN

(H. Doc. No. 252, 78th Cong., 1st sess.)

The Knife River rises in the Killdeer Mountains in west central North Dakota and flows generally easterly 165 miles to enter the Missouri River near Stanton. The stream drains an area of 2,625 square miles. The basin, with a population of 18,300 is sparsely settled, the largest towns being Hebron, Beulah, Hazen, and Killdeer, with populations of 1,267, 942, 662, and 650, respectively.

The town of Beulah has suffered three damaging floods since the time of its founding in 1913-14, the largest of which occurred in 1938. The principal flood hazard at Beulah is caused by two normally dry coulees north of the town which are inadequate to carry flood flows. Flood damages at Hazen are caused by overflows of the tributary, Antelope Creek. Hazen has suffered flood damages three times, the greatest of which also occurred in 1938, causing damage estimated at \$31,200.

In a report on the control of floods in the Knife River Basin, the Chief of Engineers recommended a plan of improvement consisting of increasing the channel capacities for the two coulees north of Beulah and constructing levees along the critical portions of the improved channels; and for raising, enlarging, and extending the existing levees and channel improvement at the town of Hazen. The estimated costs of the recommended works are \$26,100 for the town of Beulah and \$6,600 for the town of Hazen.

The committee finds that the benefits expected to accrue from the improvements exceed the cost, and it recommends that the projects be adopted at this time.

MILK RIVER, MONT.

(S. Doc. No. 103, 78th Cong., 1st sess.)

The Milk River is formed by the confluence of its North and South Forks near the St. Mary Lakes in northwestern Montana, flows into Alberta Province, and then southeasterly through Montana, a distance of 625 miles, to its junction with the Missouri River at a point 11 miles below the Fort Peck Dam. It drains an area of 24,326 square miles, of which about two-thirds is in the United States. Major floods in the basin result from rapid spring run-off and heavy spring and early summer rains. The floods resulting from early spring run-off are frequently aggravated by ice jams. Approximately 200,000 acres of agricultural land in the basin are subject to damage. The principal flood areas of the basin are included in the reach of the valley of the main stem of the river from Havre to the mouth and along the lower portions of the larger tributaries. Ten major floods have occurred on Milk River since 1880, while localized floods occur nearly every year.

The Flood Control Act of 1936 authorized local flood protection works at Saco, Glasgow, and Harlem, Mont., at estimated costs to the United States of \$26,800, \$25,800, and \$9,700, respectively. The project at Glasgow has been completed.

As a result of studies by the Corps of Engineers, in accordance with the resolutions of the Senate Committee on Commerce, it has been found advisable to modify the existing project at Harlem, Mont., to provide for flood control by means of a diversion of Thirty Mile Creek and a system of levees, at a total estimated cost to the United States of \$21,100, and the authorization of a project at Havre, consisting of levees and the construction of a diversion channel together with incidental and appurtenant works, at an estimated cost to the United States of \$313,100.

The committee notes that the Milk River was one of the tributaries of the Missouri River suffering extensive damage during the flood in April of this year and it is of the opinion that the works recommended by the Chief of Engineers in the Milk River Basin should be authorized at this time.

BOYER RIVER BASIN

(H. Doc. No. 254, 78th Cong., 1st sess.)

The Boyer River rises near Storm Lake, Iowa, and flows southwesterly about 139 miles to its confluence with the Missouri River, 13 miles north of Council Bluffs. It drains an area of 1,093 square miles. The largest towns in the basin and their populations are as follows: Missouri Valley, 4,200; Denison, 3,900; Logan, 1,700; and Dunlap, 1,500.

The Boyer River Basin is subject to fairly frequent floods, which usually result from ice jams retarding the run-off of spring thaws in March and April, or from intense rains during the late spring and early summer months in that portion of the basin above Denison. Between 1908 and 1939, 8 major floods and 13 minor floods have occurred in the Boyer River Basin. The average annual flood damage at Denison is estimated at \$2,080. Remedial measures recommended by the Chief of Engineers consist of improvement of the East Fork of Boyer River, Iowa, by levees and channel work for the protection of Denison, Iowa, at an estimated cost to the United States of \$17,830.

The committee recommends that the works be adopted in accordance with the recommendations of the Chief of Engineers.

NISHNABOTNA RIVER BASIN

(H. Doc. No. 253, 78th Cong., 1st sess.)

The Nishnabotna River is formed by the confluence of the East and West Nishnabotna Rivers at a point about 4 miles north of Hamburg, Iowa. The two streams rise in Carroll County, Iowa, and flow about a hundred miles generally southerly and parallel to each other, to their junction 12 miles above the mouth of the main stream. The system drains approximately 2,995 square miles.

Bottom lands adjacent to the main stream and its principal tributaries are subject to inundation. During the period of reliable record, 1912 to 1939, 12 floods have caused considerable damage and 15 have caused minor damage. When the Missouri River is high, silt is deposited into the lower channel of the Nishnabotna River within the Missouri River flood plain, thereby aggravating the flood condition. Real property within the city of Hamburg, valued at \$3,000,000, and 30,000 acres of highly developed agricultural lands at and below Hamburg are subject to damage. The future annual flood damage at Hamburg is estimated at \$17,750. The plan for flood protection at Hamburg, recommended by the Chief of Engineers, provides for straightening the river channel including eliminating three sharp bends below the Iowa-Missouri State line, and for raising and enlarging the existing levees from Hamburg to the mouth, at an estimated cost of \$236,000.

The committee concurs in the recommendation of the Chief of Engineers and authorization for this work has been included in the bill.

BEAR CREEK, COLO.

(H. Doc. No. 356, 78th Cong., 1st sess.)

Bear Creek rises in Summit Lake on the eastern slope of the Rocky Mountains in north-central Colorado and flows easterly 45 miles to join the South Platte River near Denver. The watershed has an area

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of 265 square miles and is almost entirely of mountainous terrain forming steep narrow stream valleys. Flash floods occur frequently on Bear Creek, usually as a result of intense local cloudburst storms centering over one or more tributary areas. The loss of 44 lives has been attributed to the floods on this stream. The War Department has investigated a reservoir system for flood control and finds that such a system would be impractical because of the number of reservoirs required to insure adequate geographical distribution of the storage and because of the problem of disposition of silt and debris in the reservoir area. The Chief of Engineers recommends a project for enlarging, straightening, and clearing the channel of Bear Creek, for removal of 4 small bridges and for relocation of the Mount Vernon Creek Channel through the town of Morrison at an estimated cost of \$220,000.

The committee notes that the average annual flood-control benefits expected to accrue from the construction of the project are in excess of the annual carrying charges and it recommends the adoption of the project.

OHIO RIVER BASIN

(Flood Control Committee Doc. No. 1, 75th Cong., 1st sess.; H. Doc. No. 685, 77th Cong., 2d sess.; H. Doc. No. 889, 77th Cong., 2d sess.; H. Doc. No. 762, 77th Cong., 2d sess.; S. Doc. No. 105, 78th Cong., 1st sess.; H. Doc. No. 444, 78th Cong., 2d sess.; and reports of the Chief of Engineers on the Cheat and Youghiogeny Rivers submitted to Congress by the Secretary of War on November 26, 1942, and March 29, 1943, respectively)

The Ohio River Basin, including all or a portion of 14 States in the eastern watershed of the Mississippi River, is one of the most important river basins in the United States from an industrial and agricultural standpoint. Since 1900, this area has been visited by 5 disastrous floods and by many smaller ones. The flood of 1936 was most destructive in the section above Wheeling, W. Va. The great flood of 1937 caused damages throughout the entire middle and lower Ohio Valley, estimated at about \$400,000,000, drove 500,000 people from their homes, paralyzed industry and communications, and caused large loss of human life and interruption to orderly development that is impossible to evaluate. The most recent major flood was the 1942-43 New Year's Eve flood on the upper Ohio. At that time, 6 flood control dams were in full or partial operation above Pittsburgh. These reservoirs reduced the crest stage at Pittsburgh by 3 feet and prevented property damage estimated at over \$15,000,000 and reduced flood stages as far downstream as Wheeling, thereby reducing damages in this reach of the Ohio River by an estimated \$14,000,000. The value of flood control works to the Nation is demonstrated by the fact that just 6 reservoirs costing some \$38,250,000 on tributaries of the Ohio River above Pittsburgh prevented, in one flood, damage estimated at about \$29,000,000. It is true that considerable damage resulted from this flood and that it continued in major proportions on down below Cincinnati, but fortunately, the rain did not cover the lower basin and the downstream cities escaped major flood damage.

Congress, in the Flood Control Acts approved June 22, 1936, and August 28, 1937, authorized a number of flood-control projects on tributaries of the Ohio River and by the Flood Control Act of 1938 approved the general comprehensive plan for the Ohio River Basin as a whole and authorized \$125,300,000 for the initiation and partial

accomplishment of that plan. The Flood Control Act of 1941 authorized the appropriation of an additional \$45,000,000 for the prosecution of the approved plan.

Pursuant to these authorizations, 22 reservoirs and 21 local protection projects have been completed and placed in operation or have been carried to the point where they are being operated to provide substantial flood-control benefits. Small amounts of additional work will be needed on some of those projects after the war. In addition, construction of 3 reservoirs and 6 local protection projects has been initiated, but completion of these projects has been suspended during the war.

The present bill modifies the general comprehensive plan approved by the 1938 Flood Control Act to include: Local protection works in the Lake Chautauqua and Chadakoin River area at an estimated cost to the United States of \$135,500, as recommended in the House Document No. 685, Seventy-seventh Congress, second session; local flood-protection works at Dillonvale and Adena on Short Creek, Ohio, at an estimated cost to the United States of \$158,200 in accordance with the recommendations in House Document No. 889, Seventy-seventh Congress, second session; local protection works on Salt River at Taylorsville, Ky., at an estimated cost to the United States of \$129,350 in accordance with Senate Document No. 105, Seventy-eighth Congress, first session; local flood-protection works at Latrobe on Loyalhanna Creek, Pa., at an estimated cost to the United States of \$112,500 in accordance with House Document No. 444, Seventy-eighth Congress, second session; a reservoir at the Burr Oak site on a tributary of the Hocking River, Ohio, at an estimated cost to the United States of \$400,000 in accordance with the recommendations in House Document No. 762, Seventy-seventh Congress, second session; the Rowlesburg Reservoir on the Cheat River at an estimated cost of \$29,230,000 for flood control and the development of hydroelectric power in accordance with the recommendations of the Chief of Engineers in a report submitted to Congress by the Secretary of War on November 26, 1942; and a system of reservoirs on the Youghiogheny River for flood control and the development of hydroelectric power at an estimated cost of \$37,970,000 in accordance with the recommendations of the Chief of Engineers in a report submitted to Congress by the Secretary of War on March 29, 1943. The bill puts the aforementioned projects into the approved comprehensive basin plan and makes them eligible for selection by the Chief of Engineers for construction under the authorizations made available for the prosecution of the comprehensive plan.

Communities in the Ohio River Valley are now largely engaged in war production which, as the war comes to an end, will be cut back drastically with resultant acute problems of readjustment to peacetime activities. Flood-control construction will aid materially in providing employment for the transition period in the Ohio River Basin. The committee believes that the important flood-control work in the Ohio River Basin should be resumed on a large scale as soon as possible. The bill proposes an additional authorization of \$70,000,000 for the prosecution of the comprehensive plan. This will enable the Corps of Engineers to prepare detailed designs and specifications for additional reservoirs and local protection projects in the Ohio River Basin and have them fully ready for prompt

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initiation when the present restrictions on the initiation of Federal public works have been lifted.

GREAT LAKES BASIN

MOOSE AND BLACK RIVERS, N. Y.

(H. Doc. No. 405, 77th Cong., 1st sess.)

Black River rises in Herkimer County in northern New York, flows in a winding course generally northwest, and discharges into Black River Bay, an arm of Lake Ontario. It is 115 miles long and drains an area of 1,917 square miles. Moose River, principal tributary of Black River, has its headwaters in Hamilton County northeast of Black River headwaters, flows generally west and joins Black River at Lyons Falls, 72 miles above the mouth. It drains an area of 434 square miles. The entire basin has a population of about 74,000; Watertown, with a population of 32,000, is the largest city.

Black River and several of its tributaries are extensively developed for power for use by mills and for public consumption, with total installed capacity of 170,600 horsepower. Considerable unused fall is still available for development. In 1919 the Black River regulating district, a State agency, was organized to regulate stream flow in the primary interest of downstream power development. This agency now also has authority to improve river channels for flood control. The regulating district has constructed one reservoir with storage capacity of 103,000 acre-feet and operates two small reservoirs with aggregate capacity of 23,000 acre-feet which were originally built by the State in connection with the Erie Canal. The regulating district has an official plan for the further regulation of Black River which contemplates construction of at least three more reservoirs. The largest of these proposed reservoirs, which would be at the Panther Mountain site on Moose River, is ready for construction as soon as financing is arranged, and a large part of the necessary lands has already been acquired.

Floods on Black River overflow parts of the bottom lands bordering the river between Lyons Falls and Carthage one or more times each year, while larger floods inundate all of these lands, aggregating about 17,000 acres. The greatest flood of record on Black River was that of December 1901, when the peak discharge at Watertown was 49,000 cubic feet per second. It is estimated that a flood of 80,000 cubic feet per second is a possibility. Average annual direct and indirect flood damages are estimated at \$183,000.

The plan of improvement recommended by the Chief of Engineers provides for the construction of a reservoir at the Panther Mountain site with a gross storage capacity of 278,000 acre-feet, of which 44,000 acre-feet would be reserved solely for flood control use and the remaining 234,000 acre-feet would be used for stream flow regulation, at an estimated first cost of \$3,800,000. His recommendation also provides that local agencies furnish without cost to the United States all available plans, hydraulic and geological studies, results of underground explorations, and other available information on the project and furnish all lands, easements and rights-of-way necessary for the construction of the project estimated at \$250,000; hold and save the United States free from claims for damages resulting from the construction of the works; maintain all the works and operate that portion of the

reservoir storage reserved for flood control purposes in accordance with regulations prescribed by the Secretary of War and that upon completion of the works they will contribute the sum of \$2,950,000 toward the first cost of constructing the project.

The committee believes that the average annual flood-control benefits expected to accrue from construction of the project, amply justify the proposed Federal investment of \$600,000 in the construction of the Panther Mountain Reservoir. It notes that the Black River regulating district desires construction of the Panther Mountain Reservoir in the combined interest of flood control and stream flow regulation and has indicated its willingness to participate in the first cost of the project in proportion to the allocation of storage space as between flood control and stream flow regulation and to maintain and operate the project under regulations prescribed by the Secretary of War, insofar as the operation of the flood-control storage is concerned. The committee recommends the adoption of the project.

CHITTENANGO CREEK AND TRIBUTARIES, NEW YORK

(H. Doc. 625, 77th Cong., 2d sess.)

Chittenango Creek rises in central New York, flows north 50 miles and empties into Oneida Lake, which, in turn, has an outlet into Lake Ontario, through the Oneida and Oswego Rivers. The drainage area of Chittenango Creek is 326 square miles. Approximately equal areas are drained by the main stream and its two principal tributaries, Limestone and Butternut Creeks, which flow north generally parallel with the main stream and join it near its mouth. In 1930 the basin had a population of 33,000, including 10,000 in the city of Syracuse. Flooding is comparatively frequent along the lower reaches of Chittenango Creek and its tributaries. Extreme floods occurred in 1898 and 1915 and in recent years two or more high-water periods have been experienced nearly every year. The average flood flow inundates 8,000 acres of agricultural lands in the principal flood area in the lower basin. The average annual direct and indirect flood damages in the agricultural areas are estimated at \$22,000. Damages in the villages of Fayetteville and Chittenango average \$7,000 annually.

The plan of flood protection found most suitable by the Chief of Engineers for obtaining flood relief involves channel improvements along the lower 40 miles of Chittenango, Limestone, and Butternut Creeks, at an estimated first cost of \$136,000 for construction and \$7,000 for rights-of-way. The Chief of Engineers recommends construction of the proposed work at an estimated cost of \$111,000 to the United States, subject to the provision that local interests contribute \$25,000 toward the construction cost in addition to providing the usual local cooperation.

The Flood Control Committee is of the opinion that the measures proposed by the Chief of Engineers are justified economically and recommends adoption of the project.

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OWASCO INLET, OWASCO OUTLET, AND THEIR TRIBUTARIES, TOMPKINS AND CAYUGA COUNTIES, N. Y.

(H. Doc. No. 815, 77th Cong., 2d sess.)

Owasco Inlet rises near Freeville, N. Y., and flows northward 20 miles through a narrow valley to Owasco Lake. The lake empties into Owasco Outlet which flows northward 16 miles and discharges into Seneca River. Crane Brook, draining an area immediately west of the Owasco Basin, is 21 miles long and flows in a generally northward direction to the Seneca River. Cold Spring Brook and its eastern tributary, Jericho Brook, which drain the watershed east of Owasco Outlet, flow in a generally northward direction and empty into Seneca River 1½ miles below their junction. The population in the area totals about 53,000, including 36,000 in the city of Auburn on Owasco Outlet near the lake.

Floods occur almost annually in the area at the time of the spring break-up and occasionally at other times as the result of heavy precipitation. They affect farm lands and the villages of Locke on Owasco Inlet; Moravia and Montville on Montville Creek, a tributary of the inlet; and Port Byron on Owasco Outlet; and cause average annual damages estimated at \$42,300. A project designed to alleviate flood conditions along the shore of Owasco Lake and in the city of Auburn was authorized by the Flood Control Act of August 18, 1941. The authorized project in this area provides for excavation of the channel of Owasco Outlet from Owasco Lake to the State dam at Auburn and for the reconstruction of the dam with removal of obstructions to be accomplished by local interests.

The need for further flood control in this area has been investigated by the Chief of Engineers. He finds that substantial flood protection can be provided at a cost commensurate with the benefits for the village of Moravia and for the agricultural land along the Owasco Inlet between Dry Creek and the lake and along State Ditch and Crane Brook. He recommends improvement of Owasco Inlet, Montville Creek, and Dry Creek at a total estimated cost of \$83,000, of which \$48,700 would be chargeable to the United States; improvement of State ditch and Owasco Outlet at an estimated cost of \$17,000, of which \$13,100 would be chargeable to the United States; and improvement of Crane Brook at an estimated cost of \$2,700, of which \$2,400 would be chargeable to the United States.

The committee believes that the improvements proposed by the Chief of Engineers are in the public interest and recommends the adoption of the project.

COLORADO RIVER BASIN

CONCHO RIVER

(H. Doc. No. 315, 76th Cong., 1st sess.)

The Concho River Basin has suffered severe flood damage over many years. The largest flood of record occurred in September 1936, when flood losses amounted to over \$2,000,000. The most serious problem in the watershed exists in the valley of the North Concho River at and near San Angelo, Tex., where the damage from the 1936 flood amounted to \$1,400,000. In order to reduce the flood

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hazard in this valley, Congress, by the act of August 18, 1941, approved the construction of a flood-control dam and reservoir on the North Concho River upstream from San Angelo, and local protection works through the city of San Angelo, at an estimated cost of \$6,800,000 to the United States. The 1941 act authorized \$2,000,000 for the initiation and partial accomplishment of this plan. The detailed plans and specifications for these works are now being prepared and the bill authorizes completion of the approved plan at an estimated additional cost of \$4,800,000.

PECAN BAYOU

(H. Doc. No. 370, 76th Cong., 1st sess.)

Pecan Bayou rises in central Texas and flows generally southeast a distance of 130 miles through generally rolling to rough country. The basin drains an area of 2,200 square miles, having a population of 49,000. Frequent floods on Pecan Bayou and its tributaries cause extensive flood damages which are especially severe on Hords Creek in the vicinity of Coleman, Tex., and along the lower portions of Pecan Bayou, where the town of Brownwood and 23,500 acres of land are subject to inundation.

Congress in the Flood Control Act of 1941 approved the construction of the Hords Creek Reservoir and the enlargement of the existing Lake Brownwood Reservoir, and authorized the appropriation of \$1,400,000 for the initiation and partial accomplishment of the approved plan.

Detailed plans for the construction of Hords Creek Reservoir and for the enlargement of Lake Brownwood Reservoir are in preparation. The committee feel that full authorization should be available for completion of these works. The bill therefore increases the authorization in the estimated additional amount of \$1,560,000.

BRAZOS RIVER BASIN

(H. Doc. No. 390, 76th Cong., 1st sess.)

Floods are comparatively frequent on the Brazos River and cause extensive damage to urban improvements and to farm crops and property. Several examinations and surveys of this stream and its tributaries for flood control, navigation, and water conservation are now in progress under authority from Congress. These studies confirm the conclusions of previous studies which have shown that the construction of a dam at the Whitney site on the Brazos River will be an integral part of any comprehensive plan for the development of the entire stream and that the need for flood protection for the town of Waco justifies its construction prior to the completion of the comprehensive plan.

In 1940 and 1941 the Flood Control Committee held extensive hearings on this project and reported that the reservoir should be constructed as a multiple-purpose project for flood control, water conservation, and the development of hydroelectric power. The Flood Control Act of 1941 approved the construction of the Whitney Reservoir and authorized the sum of \$5,000,000 for the initiation of the project. The bill proposes authorization for the completion of the

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plan approved in the act of August 18, 1941, at an estimated additional amount of \$15,000,000.

RIO GRANDE BASIN

(S. Doc. No. 104, 78th Cong., 1st sess.)

Under authority of a resolution adopted by the Committee on Commerce of the United States Senate, the Chief of Engineers has investigated the flood situation in the Rio Grande Basin in the vicinity of Creede, Colo. Creede, the county seat of Mineral County, Colo., is a mining town located on Willow Creek, a small headwater tributary of the Rio Grande. Willow Creek drains an area of 36 square miles and is formed by the confluence of the East Willow and West Willow Creeks about 4,000 feet upstream from the town of Creede. Creede is located on the detrital cone formed by Willow Creek at the mouth of its canyon. A wooden flume constructed between 1895 and 1910 with an initial capacity of about 1,800 cubic feet per second has carried the flow of Willow Creek through the town but the flume has now reached the limits of its usefulness and can no longer be depended upon to carry the floods. The Chief of Engineers recommends the construction of a new flume, approximately 3,350 feet long following the same alinement as the existing structure, at an estimated cost to the United States of \$68,500.

The committee notes that Creede is the principal gateway to an important mining region. Since the present wooden flume is now in a state of impending total failure, it will be necessary to provide a replacement if serious damage and loss of human life from floods are to be prevented in the future. The committee recommends the authorization of the project.

SAN DIEGO RIVER, CALIF.

(H. Doc. No. 635, 77th Cong., 2d sess.)

San Diego River has its source on the tableland in the Cuyamaca Mountains, near Santa Ysabel, Calif., and flows southwesterly to the Pacific Ocean through Mission Bay north of the city of San Diego. The entire San Diego River system is under investigation at the present time. However, the flood situation at the city of San Diego is such as to make it highly desirable that flood protection be provided for that community, particularly for the United States Marine Corps base, the United States naval training station, the Consolidated Aircraft plants, Federal Housing units, and a considerable amount of private residential and industrial developments, prior to the development of a comprehensive system of flood control for the entire basin.

Studies by the Corps of Engineers indicate that local flood protection for the city of San Diego, Calif., as proposed in the present interim report will be an integral part of any comprehensive plan of flood control in this basin. The plan of protection recommended by the Chief of Engineers consists of construction of a levee in the approximate location of the existing dike, making use of the latter where found practicable at the time the work is undertaken. The estimated cost of the work recommended is \$350,000 for construction and \$20,000 for lands, rights-of-way, and drainage installations. In view of the importance of protecting Federal activities in the area and in

order that the protection of Government property be not dependent upon local cooperation, the Board of Engineers for Rivers and Harbors and the Chief of Engineers recommend that the United States bear the total first cost of the improvement and maintain the works after completion.

The committee is of the opinion that flood protection for the Federal property in this area warrants a deviation from the usual conditions of local cooperation and that in this case the entire cost of the local protection projects should be borne by the Federal Government. The committee accordingly recommends adoption of the project on this basis.

VENTURA RIVER, VENTURA COUNTY, CALIF.

(H. Doc. No. 323, 77th Cong., 1st sess.)

Ventura River has its source in the Santa Ynez Mountains in southern California, flows south 32 miles and empties into the Pacific Ocean at Ventura, about 60 miles northwest of Los Angeles. The watershed has an area of 228 square miles, nearly half of which is mountainous with elevations ranging up to 6,000 feet above sea level. A serious flood problem exists in and near the city of Ventura on lower Ventura River and in the city of Ojai below Stewart Canyon. The area subject to overflow amounts to about one-third of the valuable land in the basin and has a population of around three-fourths of the total basin population. Direct flood damages in the basin during the March 1938 flood amounted to \$777,000.

The Chief of Engineers finds that the most economical plan of flood protection in this basin is one providing for a levee on the left bank of the Ventura River to protect the city of Ventura and for a debris basin at the mouth of Stewart Canyon with a concrete channel to carry flood flows through Ojai. The estimated cost of the project to the United States is \$1,600,000.

The committee notes that most of the development along the lower river is concentrated in the areas which would receive protection from this project. It believes that the benefits which would result from the elimination of the flood menace and the prevention of a serious loss of life amply justify the construction of the project and it recommends authorization by Congress.

SANTA ANA RIVER BASIN

The Santa Ana River and its upper tributaries have their source on the southern slope of the San Bernardino Mountains. The river proper flows about 27 miles through a rugged mountainous region emerging into a wide outwash area at the base of the mountains, thence southwesterly a distance of 43 miles to the head of the Santa Ana Canyon, and thence through the canyon and the Coastal Plain a distance of 30 miles into the Pacific Ocean through an artificial cut northwest of the city of Newport Beach. The beach comprises an area of 2,476 square miles southeast of Los Angeles.

From the standpoint of property damage and loss of life, the 1938 flood in the Santa Ana River Basin was the most severe of record, with property damage estimated at \$21,000,000 and loss of 43 lives. While greater floods in the Santa Ana River Basin occurred in 1862,

1876, 1884, and 1891, records of damage from these floods are incomplete. The destruction of highways and main line railroads in 1938 not only resulted in serious local damage but caused widespread losses due to interruption of transportation facilities. The most recent flood in this area occurred on January 21-23, 1943, on certain tributaries of Santa Ana River in San Bernardino and Riverside Counties, Calif., when a 3-day heavy general winter storm produced a total average rainfall of about 22 inches in the mountainous parts of the drainage area, resulting in direct and indirect flood damages estimated at \$1,840,300, of which \$1,485,900 occurred on Lytle Creek. In addition, one person drowned in the floodwaters of Lytle Creek and the normal activities of the flooded communities were disrupted. Additional intangible damages also occurred as a result of interruption in the transportation of war shipments. The effect of these floods on railroads is described in a report of the Corps of Engineers which shows that of the \$1,840,300 damage suffered from this flood in the Santa Ana Basin, \$831,000 represented damage to railroads. A similar proportion existed on Lytle Creek where \$822,500 of the total damages amounting to \$1,485,900 were suffered by the railroads.

With a view to relieving the flood hazards in this valley, Congress in the 1936 Flood Control Act authorized the construction of reservoirs and related flood-control works for the protection of the metropolitan area in Orange County, Calif. The project adopted in that Act was modified by the 1938 Flood Control Act to provide for the control of floods on the San Antonio and Chino Creeks. The modified plan provides for the construction of nine reservoirs and channel improvement on San Antonio and Chino Creeks. The Prado, Brea, and Fullerton Reservoirs have been completed and are in operation. These reservoirs substantially reduced flood damages in the Santa Ana River Basin during the flood of January 1943. Detailed planning is under way for the San Antonio, San Juan, and Carbon Canyon debris basins and for the channel improvement work on San Antonio and Chino Creeks.

Following the destructive flood in January of 1943, the Chief of Engineers prepared an interim report on the Santa Ana River covering Lytle and Cajon Creeks under authority contained in the Flood Control Act approved August 28, 1937. In this report the Chief of Engineers recommends the construction of a combination of levees and groins on Lytle and Cajon Creeks above Foothill Boulevard in San Bernardino County, Calif., the construction of an improved channel generally along the west branch of Lytle Creek below Foothill Boulevard, and use of the existing east branch as a bypass for excess flows, with such modifications thereof as in the discretion of the Secretary of War and Chief of Engineers may be advisable, at an estimated cost to the United States of \$8,055,000.

The committee held extensive hearings in June of 1943 and February of 1944 on the Santa Ana River Basin project and on the interim report covering Lytle and Cajon Creeks. In view of the effect of floods on important transcontinental railway communications which extend through Cajon Pass between southwestern California and the industrial east and midwestern parts of the country, the committee recommend adoption at this time of the project for Lytle and Cajon Creeks. For the accomplishment of the work on Lytle and Cajon Creeks, and for continuation of work on the approved plans for flood control in the

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Santa Ana River Basin and for the protection of the metropolitan area in Orange County, the committee recommend modification of the existing project and an additional authorization at this time of \$10,000,000.

LOS ANGELES AND SAN GABRIEL RIVER BASINS AND BALLONA CREEK, CALIF.

(II. Doc. No. 838, 76th Cong., 3d sess.)

The Los Angeles County drainage area, consisting of the watersheds of Los Angeles and San Gabriel Rivers and Ballona Creek, comprises an area of 1,717 square miles. In 1940 the population within the overflow area exceeded 800,000 and the value of property subject to flood damage was more than \$1,000,000,000. Four plants located in an area that would be directly affected by floodwaters in these streams have been engaged on war contracts which in 1941 exceeded a total value of \$375,000,000. In addition to these plants, other industries engaged in war production would be indirectly affected by floodwaters due to interruption of transportation facilities. The aggregate amounts of primary contracts held by these latter companies exceeded \$582,000,000. Due to the recent expansion of the war industries in this area, both the property value and population within the overflow area have increased rapidly.

These streams are subject to sudden and destructive floods resulting from rapid run-off from mountainous areas. The 1938 flood caused a loss of 49 lives and property damage estimated at \$40,400,000. Floods passing through the densely populated residential areas completely destroy many homes and leave in their places broad areas strewn with sand, gravel, and boulders. One flood from a small tributary left 40-ton boulders on a paved highway.

Congress, in the Flood Control Act of 1936, authorized a flood control project for the Los Angeles-San Gabriel River Basin, involving construction of reservoirs and principal flood channels. In the 1941 Flood Control Act Congress approved a comprehensive plan for flood control in this basin embracing the 1936 project with important extensions and additions at an estimated additional cost to the United States of \$163,500,000 and for the initiation and partial accomplishment thereof authorized the appropriation of \$25,000,000. A number of reservoirs and debris basins and extensive flood channels have been completed and placed in operation and detailed plans and specifications are now under way for additional units.

The bill proposes an additional authorization of \$25,000,000 for the prosecution of the comprehensive plan. This will enable the Corps of Engineers to proceed with the construction of additional items in the comprehensive plan to provide much-needed flood protection and to assist in readjustment to peace in this highly industrialized region.

SACRAMENTO-SAN JOAQUIN RIVER BASINS

The watersheds of the Sacramento and San Joaquin Rivers and their tributaries form the great Central Valley of California, which occupies more than 59,000 square miles in the northern and central portions of the State. The Central Valley is entirely surrounded by mountains or mountain spurs while the valley floor consists of a sloping alluvial plain which is of great agricultural importance to the State and to the Nation.

SACRAMENTO RIVER

The existing project for flood control on the Sacramento River, Calif., was adopted by the Flood Control Act of March 1, 1917, and has been modified by subsequent acts of Congress. The Flood Control Act of August 18, 1941, modified and extended the existing project for the Sacramento River to increase the protection of 1,000,000 acres of land lying within the area of the existing project which were in danger of serious flooding from the overtopping of levees not yet completed to project grade or from possible failure of levees of insufficient section. That act authorized an additional \$10,500,000 for the completion of work planned under the existing project and its modification in addition to the previous authorizations which limited Federal participation to a total of \$20,100,000.

The Sacramento River Valley is one of the most highly productive regions in the United States and numerous specialized crops are grown in this area. Transcontinental railroads and interstate highways of great military importance traverse the valley.

At the committee's request in the recent hearings, the report of the Board of Engineers for Rivers and Harbors on an interim report covering the Sacramento River and tributaries from Collinsville to Shasta Dam was made available to the committee. In that report the Board of Engineers stated that the most urgent need of the area at this time is additional flood protection which can be provided to a considerable extent by the construction of the low Table Mountain Dam, the construction of Black Butte Dam on Stony Creek, the extension of the existing flood control project, and the construction of levees and channels unrelated to the existing project on the Sacramento River, all at an estimated cost to the United States of \$46,056,000. This initial work would make possible the reclamation of Butte Basin, materially improve the degree of protection along the Sacramento River, and give protection to certain localities which lie outside the limits of the existing flood-control project. The committee concurring with the Board recommends further modification of the existing project to embrace these works and proposes an authorization of \$15,000,000 for carrying on the modified project. Subsequent to the hearings, the committee has received a number of communications from local interests in the vicinity of the Table Mountain Reservoir project expressing strong opposition to any high dam at that site, as would be necessary for the ultimate plan of comprehensive development outlined in the Board of Engineers' report. Since the flood-control needs can be met by the recommended low dam the bill includes a proviso stating that the modification of the project shall not be construed to authorize the high dam.

SAN JOAQUIN RIVER BASIN

KERN RIVER, CALIF.

(H. Doc. No. 513, 78th Cong., 2d sess.)

Kern River draining an area of some 2,400 square miles on the western slope of the Sierra Nevada Mountains is the most southerly of the major streams flowing into the San Joaquin Valley. The river is formed by the confluence of the North and South Forks near the town of Isabella, flows southwest 72 miles past the city of Bakersfield

to a point just north of Buena Vista Lake where its waters are either diverted into the Buena Vista Lake Basin for temporary storage or are carried toward Tulare Lake Basin by improved flood and irrigation channels. Under normal conditions of run-off the flow of Kern River below Bakersfield is gradually dissipated by irrigation diversions so that Kern River water reaches Tulare Lake Basin only during large floods.

Kern River floods are of frequent occurrence and fall into two types, those which occur during the winter months as a result of intense rainfall in the mountains and foothills, and those which come in the late spring as a result of melting snows. Since February 1937, there have been two winter floods and two late spring floods on Kern River. Winter floods cause extensive damage to levees and irrigation structures and seriously threaten inundation of Bakersfield. Late spring floods cause little damage in the upper delta but cause flooding of up to 15,000 acres of reclaimed land in Buena Vista Lake, cause inundation of some 110,000 acres along the various channels southeast of Tulare Lake, and with the Kings, Kaweah, and Tule Rivers contribute to flooding of agricultural lands in the Tulare Lake Basin. Inundated areas in Buena Vista and Tulare Lake remain out of production for 1 or more years until the water is dissipated through evaporation or irrigation use. Flood damages due to Kern River floods average \$879,000 annually. Of this sum \$441,000 represents the proportionate part of the damage in the Tulare Lake Basin caused by flood waters of Kern River.

Plans found most suitable by the Chief of Engineers for improvement in the Kern River area provide for the construction of a storage reservoir at the Isabella site and for its operation in the combined interests of flood control and water conservation. The report of the Chief of Engineers proposes that the cost of the Isabella Reservoir be borne jointly by the United States and the water users, the United States bearing the cost for flood protection and the water users paying the cost for irrigation storage either in a lump sum or in annual installments.

In the hearings of 1943 and 1944 on this bill and also in the hearings of 1941, the committee has given local interests full opportunity to express their views. The committee has also called the Commissioner of Reclamation and his representatives to testify regarding the Bureau's plans for the Kern River. Local interests have convinced the committee that there is urgent need for flood control on the Kern River and that protection can best be provided by the construction of the Isabella Dam for flood control with secondary benefits from water conservation. Local interests have been unanimous in their statements that they are willing and able to pay for the irrigation benefits received and that they desire that the project be constructed and operated by the Corps of Engineers, since its dominant purpose is flood control. After very thorough consideration of the reports of the Corps of Engineers and the Bureau of Reclamation and the testimony of witnesses, the committee recommends authorization of the Kern River project at an estimated cost of \$6,800,000, the works to be constructed, operated, and maintained under the direction of the Secretary of War and the supervision of the Chief of Engineers. The committee believes that the interests of the Bureau of Reclamation are fully safeguarded by the cooperative procedures recommended by

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the Chief of Engineers in his report, which recommendations attain the force of law through adoption of the report in the bill.

KAWEAH AND TULE RIVERS

(Flood Control Committee Doc. No. 1, 78th Cong., 2d sess.)

Kaweah River, with a watershed area of 1,250 square miles, rises in the glacial lakes of the Sierra Nevada and flows southwesterly through low foothills to the floor of the San Joaquin Valley. At this point the river divides into two forks, one known as St. Johns River which joins with Cottonwood and Cross Creeks and empties into the Tulare Lake Basin; the other, continuing as Kaweah River, flows about 4 miles southwesterly, where it divides into numerous channels which unite with Tule River or Cross Creek to enter Tulare Lake Basin. Tule River, having a watershed area of 630 square miles, drains the western slope of the Great Western Divide immediately south of the Kaweah watershed. The Tule River is formed by its North and Middle Forks near Springville and flows thence southwesterly and westerly across the alluvial fan to Tulare Lake Basin. Principal activities in the Kaweah and Tule areas include raising and processing of agricultural products, production of petroleum and minerals, and a limited amount of manufacturing.

Hydrological conditions in the Kaweah-Tule areas are peculiar to the south San Joaquin Valley and differ from those generally encountered in other sections of the country. The greater part of the precipitation in this area occurs in the form of snow in the mountainous regions. Floods of comparative frequency on the Kaweah and Tule Rivers are of two distinct types, those which occur during the winter months as a result of intense rainfall in the mountains and foothills and those which come in the late spring as a result of melting snow in the headwater area. Winter floods cause overflow and damage in the upper delta areas but their floodwaters seldom reach Tulare Lake Basin. Spring floods have a much larger total run-off volume and generally inundate areas along the lower reaches of the streams and in the Tulare Lake Basin with floods of major proportions causing extensive overflow damages. It is estimated that damages from Kaweah River floods average \$285,000 annually and that damages attributable to Tule River floods average \$216,500 annually. In addition to these direct losses, substantial indirect and intangible losses not susceptible of direct valuation occur.

The plan of improvement recommended by the Chief of Engineers and contained in Flood Control Committee Document No. 1, Seventy-eighth Congress, second session, provides for the construction of a storage reservoir on Kaweah River at the Terminus site, to be operated in the combined interests of flood control and water conservation, and for the use of available spreading facilities for the dissipation of floodwaters and the replenishment of ground-water supplies, at an estimated cost of \$4,600,000. The plan found most suitable in the Tule River Basin provides for construction of a storage reservoir at the Success site to be operated in the combined interests of flood control and water conservation and for use of available spreading facilities for the dissipation of floodwaters and the replenishment of ground-water supplies at an estimated cost of \$3,450,000.

In the opinion of the Flood Control Committee, the Terminus and Success projects will provide urgently needed flood control on the Kaweah and Tule Rivers. It believes that in order to insure the expected flood control benefits the reservoirs should be constructed, operated, and maintained under the direction of the Secretary of War and the supervision of the Chief of Engineers, with arrangements for payment by the State or other responsible agency to the United States for the conservation storage when used, all as recommended by the Chief of Engineers. The committee recommends approval of the plan for the Kaweah and Tule Rivers and authorization of \$4, 600,000 for initiation and partial accomplishment thereof.

KINGS RIVER AND TULARE LAKE BASIN

(H. D. No. 630, 76th Cong., 2d sess.)

Kings River rises on the western slope of the Sierra-Nevada in Fresno County, Calif. The upper basin above the town of Piedra is rugged and mountainous while below Piedra the river enters a relatively flat alluvial valley where it divides, one branch known as Fresno Slough flowing north to join the San Joaquin River and the other turning south to Tulare Lake. The area below Piedra, including Tulare Lake, is known as the Kings River Service Area. Of the 1,000,000 acres in the service area, some 850,000 acres are farm land generally under intensive irrigation.

The floods which occur on the Kings River are generally of the two types that occur throughout the San Joaquin River Basin. Since May 1937 five floods have occurred on the Kings River or Tulare Lake, three being of the winter type caused by intense rainfall and two of the late spring type caused by melting snow in the upper watershed area. A total of over 236,000 acres of high grade farm land are subject to overflow and the areas inundated in Tulare Lake Basin are kept out of production from 1 to several years. The average annual flood damages in the Kings River service area are in excess of \$1,300,000.

The plan of flood protection recommended by the Chief of Engineers provides for the construction of a reservoir on Kings River at the Pine Flat site for flood control and water conservation together with channel improvements on Kings River at an estimated cost of \$19,700,000. The Flood Control Committee is of the opinion that the cost of the Pine Flat Reservoir should be borne jointly by the United States and the water users, the United States bearing the cost for flood protection and the water users the cost for irrigation storage either by lump sum payment or in annual installments, with the division of cost to be determined by the Secretary of War on the basis of continuing studies by the Bureau of Reclamation, the War Department, and local organizations.

The Kings River project has also been the subject of a report submitted in 1940 by the Bureau of Reclamation. The structures proposed are essentially those recommended by the Corps of Engineers but the Bureau of Reclamation recommends that the project be operated by the Bureau and that the provisions of reclamation law be applied thereto. The Bureau considers that the project is now authorized under reclamation law but no funds have yet been appropriated for detailed planning or construction and no work has been undertaken.

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The committee has heard extensive testimony from local interests and has questioned the Chief of Engineers and the Commissioner of Reclamation at length in hearings in 1941, 1943, and 1944. Local interests have all impressed the committee with the seriousness of the flood hazard and their desire that the proposed works be constructed as soon as possible. They are practically unanimous in their statements that the dominant interest in the project is flood control with irrigation of secondary consideration. Such irrigation benefits as would result would accrue to land now already developed without bringing into production additional arid land. Local interests are so strongly in opposition to a project built under reclamation law that they have stated that rather than have the project built by the Bureau of Reclamation they prefer no Federal project at all.

After very careful consideration of the reports, the communications of the President which are printed in the hearings, and the testimony and written statements in the hearings, the committee is convinced that the project should be authorized by Congress as a flood-control project with adequate safeguards for the interests of the Bureau of Reclamation. The committee believes that these safeguards are fully covered in the language contained in the bill. The committee therefore recommends authorization of the project as proposed in the bill at an estimated cost of \$19,700,000.

MERCED COUNTY STREAM GROUP, CALIFORNIA
(H. D. No. 473, 78th Cong., 2d Sess.)

The streams comprising the Merced County stream group rise in the Sierra Nevada foothills of California and flow in a generally westerly direction to join the San Joaquin River west of the city of Merced. The streams form three general groups: Bear Creek, with its tributaries Black Rascal, Canal, Fahrens, and Burns Creeks; Mariposa Creek with its tributaries Miles and Owens Creeks; and Deadmans Creek with its tributaries, Little Deadmans, Big Deadmans and Dutchmans Creeks. The Deadmans Creek group crosses an undeveloped area of low-grade pasture land for which improvements for flood control and related works would not be warranted. The remainder of the Merced County stream group drains an area of 392 square miles ranging from mountainous to low foothills and a lower area of 312 square miles of broad alluvial valley.

Floods on these streams are caused by heavy rainfall in the foothills and mountains during winter months. The area has experienced 16 damaging floods in the past 40 years. The total area of 136,000 acres subject to flooding includes a substantial portion of the developed area of the Merced irrigation district. The War Department estimates that future flood damages in the Merced County stream group will average \$92,700 annually.

Plans found most suitable by the Chief of Engineers for improvement in the Merced County stream group provide for the construction of four small detention reservoirs in the foothill area with aggregate storage capacity of 32,000 acre-feet; the construction of two diversion canals to distribute flood waters between various channels; completion of the enlargement of Miles Creek previously undertaken by local interests, and clearing of obstructions from other channels, all at an estimated cost to the United States of \$1,300,000.

The committee finds that the improvements recommended by the Chief of Engineers will eliminate practically all damage resulting from floods on Black Rascal, Burns, Bear, Miles, Owen, and Mariposa Creeks. In addition, it is of the opinion that high-ground water conditions which are serious in the Merced County stream group would be greatly improved because of the better drainage resulting from the channel clearing and flood-water detention. The committee recommends the adoption of the project.

LOWER SAN JOAQUIN RIVER

(Flood Control Committee Doc. No. 2, 78th Cong., 2d sess.)

The lower San Joaquin River group of streams comprises the San Joaquin River and its tributaries north of Kings River and those other streams tributary to Tulare Lake Basin which together constitute the south half of the San Joaquin Valley and which except during major floods contribute no run-off to the San Joaquin River. The San Joaquin River has its source in the Sierra Nevada, flows generally southwesterly through the mountains and foothills to the vicinity of Friant where it enters the flat alluvial valley through which it flows west 60 miles to Mendota. At Mendota the river turns northwest and flows 157 miles to Mossdale at the head of the San Joaquin Delta which is an extensive area of reclaimed tidal swamp lands through which the river flows with numerous side channels and sloughs to join the Sacramento River at the head of Suisun Bay near Antioch. The river drains an area of 17,000 square miles, exclusive of the Tulare Lake Basin drainage area. Merced, Tuolumne, Stanislaus, and Mokelumne Rivers, which are the principal tributaries of the San Joaquin River, also have their source in the Sierra Nevada, and flow generally westerly through the mountains and foothills to enter the alluvial valley and join the main river from the east in its lower reaches.

Floods which are comparatively frequent on the San Joaquin River and its tributaries are of two types, those that occur during the winter as a result of intense rainfall and those which come in the late spring as a result of melting snow in the mountain areas. Since 1900 there have been 38 floods of damaging magnitude on the major streams of the San Joaquin River group, 15 of which resulted primarily from rain while the remaining 23 were caused by melting snow. The area subject to inundation in the San Joaquin Valley above the head of the Delta is approximately 390,000 acres of which 160,000 acres are partially protected by levees. In the Delta, 279,000 acres have been protected by levees against ordinary floods on the San Joaquin River and Sacramento Rivers, but due to the limited heights to which levees can be built, these lands may be inundated by major floods on the two rivers. The War Department estimates that direct flood damages along the San Joaquin Valley and in the San Joaquin Delta area will average \$1,425,000 annually.

The Chief of Engineers has investigated the flood situation along the lower San Joaquin River and its tributaries, in response to the authorizations contained in the Flood Control Act approved June 22, 1936. He finds that the most feasible plan of improvement in this area consists of the construction of the New Melones Reservoir on

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the Stanislaus River for flood control and other purposes at an estimated first cost of \$7,210,000; Federal participation with San Francisco and with other local interests in the New Don Pedro or other suitable reservoirs in the Tuolumne Basin to the extent justified by proportionate benefits for flood control, now estimated at \$5,800,000 for the equivalent of 320,000 acre-feet of storage in the Jacksonville Reservoir; and the construction of channel improvements and levees on San Joaquin River and tributary channels at an estimated first cost to the United States of \$2,875,000 subject to the usual conditions of local cooperation for the channel improvement and levee work.

The committee notes that the New Melones Reservoir for flood control as proposed by the Chief of Engineers will be so developed as to permit raising in the future to provide capacity for conservation storage; that flood control storage in the Tuolumne River Basin can be most economically provided by Federal participation in the construction of reservoirs now planned by the city of San Francisco and other local interests for the Tuolumne River Basin; and that the channel improvements and levees proposed for the San Joaquin River and its tributaries are integral parts of any comprehensive plan for flood control in the lower San Joaquin Valley. The committee recommends approval of the plan and an authorization at this time of \$8,000,000 for the initiation and partial accomplishment thereof.

COQUILLE RIVER BASIN

(H. Doc. No. 620, 77th Cong., 2d sess.)

The Coquille River is formed by the junction of the North and South Forks near the town of Myrtle Point in southwestern Oregon, flows generally westerly for 35 miles and enters the Pacific Ocean 125 mile south of the mouth of the Columbia River. It drains an area of 1,070 square miles of generally rugged and densely timbered area. Major floods occur in the Coquille River Valley on the average of about once in 10 years, while freshets which overtop the river bank may be expected to occur several times annually.

The Chief of Engineers has investigated the flood situation in this area and he finds that the construction of levees in the lower reach of the river and bank protection at mile 9 and inclosure of washes at the head of Beaver Slough and Fat Elk drainage districts are justified. He recommends this work at an estimated construction cost of \$168,000, of which \$143,000 is the estimated cost to the United States, subject to the condition that responsible local agencies contribute the sum of \$25,000 toward the cost of construction, in addition to the usual requirements of local cooperation.

The committee notes that the proposed work will provide substantial flood protection with benefits in excess of the costs and has included an authorization for this project in the bill.

NEHALEM RIVER BASIN

(H. Doc. No. 621, 77th Cong., 2d sess.)

Nehalem River rises in the Coast Range Mountains in northwest Oregon and flows in a generally southwesterly direction for a hundred miles, discharging into Nehalem Bay, 40 miles south of the mouth of

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the Columbia River. It drains an area of 862 square miles of rugged and heavily timbered terrain. Approximately 8,000 acres of arable land in the upper basin and 4,700 acres in the lower basin are subject to overflow. In the lower basin, damages attributable to river flows alone are infrequent, but nearly half of the lowland is subject to annual overflow caused by high tides or a combination of high tides and high river flows. The maximum known flood occurred in December 1933, reaching a stage of 20 feet above mean lower low water near the mouth and caused damage estimated at \$7,700 in the upper basin and \$58,700 in the lower basin.

A report on the flood situation in the Nehalem River Basin has been transmitted to Congress in response to authorizations contained in the acts approved June 11, 1935; February 26, 1936, and June 22, 1936. The Chief of Engineers finds that protection can be afforded for an area of 770 acres by the reconstruction and extension of an existing levee at an estimated cost for construction of \$33,000, of which \$23,000 would be borne by the United States and \$10,000 contributed by local interests.

The committee is of the opinion that the work recommended by the Chief of Engineers is warranted and accordingly has included in the bill an item authorizing its construction.

WILLAMETTE RIVER BASIN

(H. Doc. No. 544, 75th Cong., 3d sess.)

The Willamette River is formed by the coast and Middle Forks which join a few miles above Eugene, Oregon. The river then flows north 189 miles to enter the Columbia River 99 miles above its mouth. The Willamette Basin lies between the Cascade Range on the east and the coast range on the west. The mountainous areas, which comprise a large part of the basin, are characteristically rugged and generally covered by forests. The valley floor proper is a broad alluvial plain through which the main stream and the lower sections of its tributaries flow in winding courses. The basin has a drainage area of 11,200 square miles. The population is approximately 650,000, engaged in farming and forestry and the processing of those products. The farm lands in the valley are very fertile and are intensely cultivated.

Floods in the basin may be expected from November through April and major floods occur in the period from late November to early February. Flood damages to farm lands and communities are very heavy. The most recent flood in this area occurred in the period between December 31, 1942, and January 4, 1943, when the stage at Albany exceeded bankfull stage by 13.6 feet and an area of 342,300 acres was inundated, causing damage estimated at \$5,708,000.

Congress authorized bank-protection works at several localities in the basin in the Flood Control Act of 1936 and in the act of June 28, 1938, approved the general comprehensive plan for flood control, navigation, and other purposes in the Willamette River Basin as set forth in House Document No. 544, Seventy-fifth Congress, third session, and authorized \$11,300,000 for the initiation and partial accomplishment of that plan. The Flood Control Act of 1941 authorized an additional appropriation of \$11,000,000 for the prosecution of this comprehensive plan. With authorization of funds thus

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far provided by Congress the War Department has completed most of the bank-protection works along the Willamette, Clackamas, Molalla, and Santiam Rivers, and the Fern Ridge and Cottage Grove Reservoirs. The preparation of detailed plans for four other reservoirs in the approved plan is well under way.

The committee recognizes the importance of carrying forward the flood-protection works in the Willamette River Basin to an early completion and it believes that the sum of \$20,000,000 should be authorized at this time in order that this important work may continue immediately following the cessation of hostilities.

COLUMBIA RIVER BASIN**SNAKE RIVER, IDAHO AND OREG.**

(H. Doc. No. 452, 77th Cong., 1st sess.)

The Snake River is the principal tributary of the Columbia River. It rises in the Rocky Mountains in Yellowstone National Park, Wyo., and flows in a general westerly and northerly direction to join the Columbia River at Pasco, Wash. It drains an area of 109,000 square miles. The area in the Snake River Valley most seriously affected by floods is the agricultural district lying on both sides of the river along the 20-mile stretch between Heise and Roberts, Idaho. The channel through this reach has a capacity of about 20,000 cubic feet per second. The maximum flood of record occurred in 1894 with a peak discharge of 65,000 cubic feet per second in this reach. During the past 50 years, 38 floods have exceeded 20,000 cubic feet per second.

The Chief of Engineers has investigated the flood problem on the Snake River in accordance with the authority contained in an act of Congress approved March 4, 1937, and has submitted his report thereon to Congress. The Chief of Engineers reports that the most suitable plan for protecting the Heise-Roberts area provides for reserving 500,000 acre-feet of storage space for flood-control use in the Grand Valley Reservoir now under consideration by the Bureau of Reclamation supplemented by channel improvement work between Heise and Roberts, and he recommends that the latter be undertaken at an estimated cost to the United States of \$734,000 together with protection to the river banks near Weiser, Idaho, against erosion at an estimated first cost of \$9,000.

The committee believes that the recommended channel improvement and bank protection, in combination with flood-control storage in the Grand Valley Reservoir when that project is constructed, will offer the most satisfactory means of flood protection in this area. The committee, therefore, recommends its adoption.

PALOUSE RIVER

(H. Doc. No. 888, 77th Cong., 1st sess.)

The Palouse River rises in the Bitterroot Mountain Range in Idaho and flows 140 miles generally west through the State of Washington to enter the Snake River 59 miles above the mouth. It drains an area of 2,980 square miles. The stream valleys of Palouse River, the South Fork of Palouse River, and other tributaries are subject to damaging floods. The damages have been concentrated principally in

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urban areas and suburbs. Investigations made by the Corps of Engineers show that the control of floods by means of storage reservoirs alone or in combination does not appear to be economically feasible. However, local protection works at the towns of Pullman and Colfax will produce benefits sufficient to justify the cost of construction.

In his report on the flood situation on the Palouse River, the Chief of Engineers recommends the construction of flood-control works on the South Fork of Palouse River at Pullman and on Spring Flat Creek and Palouse River in the vicinity of and through Colfax, consisting of channel enlargement and modifications, levees, flood walls, and revetments, at an estimated cost to the United States of \$478,000.

The committee believes that the improvements proposed by the Chief of Engineers are meritorious and in the public interest and recommends adoption of the project.

ALKALI CANYON

(H. Doc. No. 631, 77th Cong., 2d sess.)

Alkali Canyon is a short tributary of the Columbia River entering from the south. It is about 12 miles long and flows from a divide 4½ miles north of the town of Rock Creek to the Columbia River at Arlington. The flood problem on Alkali Canyon is confined largely to the lower three-fourths of a mile within the town of Arlington. The largest known flood occurred in June of 1927 as a result of an intense local cloudburst storm. The sudden flood destroyed many residential and commercial buildings, washed out roads, and caused damage estimated at \$316,600.

The Chief of Engineers has investigated the flood problem on Alkali Canyon and has submitted his report thereon to Congress. He recommends the construction of a project for flood protection at Arlington by means of an enlarged channel lined with concrete or grouted revetment and appurtenant works at an estimated cost to the United States of \$118,000.

The committee is of the opinion that local flood-protection measures at Arlington, Oreg., are warranted and recommends the adoption of the project proposed by the Chief of Engineers.

WILLAPA RIVER, WASH.

(H. Doc. No. 701, 77th Cong., 2d sess.)

Willapa River is a coastal stream in southwestern Washington that rises in the Willapa Hills and flows northwesterly 37 miles to Willapa Bay, located about 30 miles north of the mouth of the Columbia River. The drainage area of 240 square miles is developed principally for timber resources. The principal flood problem on Willapa River is the frequent inundation of certain areas along the lower river and in the city of Raymond, as a result of high tidal stages augmented by high winds. Private interests have built levees for the protection of about 800 acres of tidal flats from tidal overflow. These levees are in good condition but are of insufficient height.

The Chief of Engineers has investigated the flood situation on the Willapa River in response to the authorization contained in the Flood

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Control Act approved June 28, 1938, and has submitted a report in which he recommends construction of a levee system at Raymond to enclose the low-lying sections, at an estimated cost to the United States of \$127,000.

The committee finds that the estimated benefits from the proposed work exceed the cost by a substantial margin and believes that the project should be adopted as recommended by the Chief of Engineers.

SECTION 8. PRELIMINARY EXAMINATIONS AND SURVEYS

Section 8 of the bill authorizes and directs the Secretary of War to cause preliminary examinations and surveys for flood control and allied purposes, including channel and major drainage improvements and protection from floods aggravated by or due to tidal effect, at the localities designated in said section; and the Secretary of Agriculture is authorized and directed to cause preliminary examinations and surveys for run-off and water-flow retardation and soil erosion prevention on the watersheds of these same localities.

This section is similar to examination and survey sections contained in the Flood Control Acts of 1936 and subsequent acts and it clarifies the language contained in those acts to show definitely that the words "flood control" shall be construed to include channel and major drainage improvements. In accordance with its usual policy, the Flood Control Committee has included in this section the streams and areas in all bills for examinations and surveys which have been introduced since the last general flood-control act.

SECTION 9. AUTHORIZATION IN THE BILL

The general flood-control legislation enacted between 1936 and 1941, inclusive, has provided authorizations totaling \$965,000,000 for the construction of 460 reservoirs and local flood-protection projects. Of these, 185 projects have been substantially completed and 46 more projects were in various stages of construction when suspended in order to conserve materials, equipment, and manpower for the war effort. Details of the present status of the authorized flood-control program are contained in the following tabulations.

Status of authorizations for flood control

Region	Total authorizations to date		Projects undertaken		Remainder of present authorizations		Authorizations in this bill	
	Number of projects	Estimated cost	Number of projects	Estimated cost	Number of projects	Estimated cost	Number of projects	Estimated cost
New England (New England Division).....	31	\$73,904,000	13	\$33,444,000	18	\$40,460,000	18	\$42,351,000
Atlantic Seaboard and Eastern Gulf (North, Middle, and South Atlantic Divisions).....	63	74,798,800	23	43,283,000	40	31,515,800	6	24,774,000
Lower Mississippi Valley, Southwestern and Western Gulf (Lower Mississippi Valley and Southwestern Divisions).....	98	291,866,200	44	217,921,200	54	73,945,000	25	125,701,900
Upper Mississippi Valley (Upper Mississippi Valley Division).....	56	22,789,800	33	10,756,200	23	12,033,600	8	11,493,440
Ohio Valley (Ohio River Division).....	65	270,608,600	38	230,288,600	27	40,320,000	15	70,000,000
Great Lakes (Great Lakes Division).....	29	5,163,300	4	492,200	25	5,761,100	3	775,200
Missouri Valley (Missouri River Division).....	18	32,593,400	5	20,087,300	13	12,506,100	12	216,785,730
Pacific Seaboard and Great Plains (Pacific Division).....	100	191,739,800	71	120,928,100	29	70,811,700	27	114,002,000
Total, flood control, general.....	460	964,463,900	231	677,110,600	229	287,353,300	112	605,883,270
Lower Mississippi River and tributaries project.....								201,952,000
Total authorizations in bill.....								807,835,270

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RESERVOIRS, LEVEES, AND WALLS FOR FLOOD CONTROL**51***Comprehensive plans for flood control and other purposes in major river basins*

Basin	Present approved plan		Total authorizations to date	Total appropriations to date	Total estimated Federal cost	
	Number of projects	Total estimated Federal cost			Projects undertaken	Basin authorizations in this bill
Arkansas River.....	13	\$122,619,000	\$30,000,000	\$12,188,200	\$42,505,000	\$35,000,000
Connecticut River.....	30	98,602,000	45,684,000	20,648,200	23,903,000	30,000,000
Los Angeles and San Gabriel Rivers.....	54	238,813,000	108,389,000	73,140,200	78,837,000	25,000,000
Merrimack River.....	9	21,000,000	21,000,000	9,541,000	9,541,000	
Missouri River.....	10	144,576,000	16,000,000	6,575,000	8,977,000	200,000,000
Ohio River.....	186	581,052,000	235,439,800	141,302,600	226,321,200	70,000,000
Santa Ana River.....	11	34,767,000	28,500,000	11,257,900	11,257,900	10,000,000
Upper Mississippi River.....	23	89,351,000	9,300,000	1,111,600	1,248,000	10,000,000
White River.....	8	155,064,000	49,000,000	30,729,300	36,000,000	45,000,000
Willamette River.....	10	82,308,000	22,300,000	9,196,600	9,196,600	20,000,000
Total.....	354	1,568,152,000	585,512,800	315,690,600	444,786,700	445,000,000

The committee wishes to emphasize that this is a post-war bill to assist in attaining two very worthy post-war objectives, to wit: Orderly adjustment from war to peace and protection of lives and property from the ravages of floods. This bill proposes to approve 112 worthy flood-control projects recommended by the Chief of Engineers and to increase the authorizations for flood-control construction in the amount of \$810,000,000. This authorization added to the amounts remaining available from prior legislation will provide a large working balance for numerous projects well distributed across the Nation and diversified as to type between large dams, concrete flood walls, channel improvements, earth levees, and combinations of these types. The greatest concentration of work is in the populous areas where hazards are most serious and where post-war adjustment will be most severe.

The progress of carrying out these authorizations will be determined by Congress through control of the amounts appropriated for flood-control work. The committee has been assured by the Chief of Engineers that the Corps of Engineers is ready and able to embark on a very large program of flood-control construction subject only to the availability of authorization and appropriations. At the rate of appropriations before the war emergency this bill will provide for about 6 years of construction. If post-war appropriations are larger, there will be consequent speeding up of work. The committee believes that enactment of this bill is an essential element in preparation for a large public-works program of worthy and carefully conceived projects and it strongly recommends speedy action on the bill.

SECTION 10. PROJECTS RECOMMENDED BY THE SECRETARY OF AGRICULTURE

Section 10 authorizes the prosecution of measures for run-off and water-flow retardation and soil erosion prevention by the Department of Agriculture on eight watersheds on which that Department has made surveys pursuant to the acts of 1936 and 1938 and for which projects have been reported favorably by the Secretary of Agriculture. These projects, as provided by law, have been reviewed by and correlated with the plans of the Corps of Engineers.

The works of improvement included in these eight projects will afford substantial reductions in the damages suffered from the frequent small and medium-sized floods that occur on headwater tributary streams generally upstream from works planned by the Corps of Engineers. They will also reduce greatly the quantity of erosion debris deposited in stream channels and reservoirs and upon flood plains. In addition, important benefits will accrue to the owners and operators of lands, upon which the measures will be applied, in the form of increased yields of crops and forest products, and increased productivity of pasture due to reduction in erosion and improvement in density and quality of vegetative cover.

The works proposed on these eight projects will provide a valuable complement to structures on waterways that have been or are likely to be built by the Corps of Engineers.

SECTION 11. REAUTHORIZING APPROPRIATIONS FOR THE DEPARTMENT OF AGRICULTURE

Section 11 reauthorizes the balance of the appropriation of \$10,000,000, previously authorized in the act of June 28, 1938, for expenditure by the Department of Agriculture for the improvement of watersheds during the post-war period.

SECTION 12. EMERGENCY WORK BY THE DEPARTMENT OF AGRICULTURE

Section 12 of this bill amends section 7 of the act of June 28, 1938. This amendment would permit the Secretary of Agriculture to undertake emergency measures on denuded watersheds to prevent hazards due to flash floods and destructive erosion that follow the loss of protective cover by forest fires or other catastrophies, especially in areas of steep slopes and erodible soils. Such emergency measures would be authorized without, in every case, having to wait for specific authorization to the Corps of Engineers for engineering structures on the waterways concerned. A limitation of \$100,000 a year is imposed.

CHANGES IN EXISTING LAW

COMPLIANCE CLAUSE 2 (A), RULE XIII

EXISTING LAW

(Flood Control Act, approved June 22, 1936, 49 Stat. 1570)

SEC. 1. It is hereby recognized that destructive floods upon the rivers of the United States, upsetting orderly processes and causing loss of life and property, including the erosion of lands, and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare; that it is the sense of Congress that flood control on navigable waters or their tributaries is a proper activity of the Federal Government in cooperation with States, their political subdivisions, and localities thereof; that investigations and improvements of rivers and other waterways, including watersheds there-

THIS BILL

That the words "flood control" as used in section 1 of the Act of June 22, 1936, shall be construed to include channel and major drainage improvements,
* * *

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of, for flood-control purposes are in the interest of the general welfare; that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.

THIS BILL

SEC. 3. In order to fully utilize dam and reservoir areas under the control of the War Department, the Chief of Engineers, under the supervision of the Secretary of War, is authorized to construct, maintain, and operate recreation, conservation, and other facilities thereat advantageous to the interests of the United States, or to permit the construction, maintenance, and operation of such facilities. The Secretary of War is authorized to grant leases of lands, structures, or facilities in said areas for such periods and upon such terms as he may deem reasonable. All moneys received for such leases or privileges shall be deposited in the Treasury of the United States as miscellaneous receipts.

SEC. 4. That the Secretary of War is authorized to sell to States, municipalities, private concerns or individuals, at such prices and on such terms as he may deem reasonable, for domestic and industrial uses surplus water that may be available at any reservoir under the control of the War Department. All moneys received from such sales shall be deposited in the Treasury of the United States as miscellaneous receipts.

SEC. 5. Hereafter, it shall be the duty of the Secretary of War to prescribe regulations for the use of storage available for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds provided on the basis of such purposes, and the operation of any such project shall be in accordance with such regulations.

SEC. 6. Hereafter, whenever in the opinion of the Secretary of War and the Chief of Engineers any dam and reservoir project operated under the direction of the Secretary of War can be consistently used for reclamation of arid lands, it shall be the duty of the Secretary of the Interior to prescribe regulations for the use of the storage available for such purpose, and the operation of any such project shall be in accordance with such regulations. Such rates, as the Secretary of the Interior may deem reasonable, shall be charged for the use of said stored water; the moneys received to be deposited into the Treasury to the credit of miscellaneous receipts.

EXISTING LAW

(Flood Control Act, approved August 18, 1941, Public Law 228, 77th Cong.)

SEC. 3. That the following works of improvement for the benefit of navigation and the control of destructive floodwaters and other purposes are hereby adopted and authorized in the interest of national security and the stabilization of employment, and shall be prosecuted as speedily as may be consistent with budgetary requirements, under the direction of the Secretary of War and the supervision of the Chief of Engineers in accordance with the plans in the respective reports hereinafter designated and subject to the conditions set forth therein: *Provided*, That penstocks or other similar facilities adapted to possible future use in the development of hydroelectric power shall be installed in any dam herein authorized when approved by the Secretary of War upon the recommendation of the Chief of Engineers and of the Federal Power Commission: * * *

SEC. 4. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys for flood control, to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the following-named localities, * * *.

THIS BILL

SEC. 7. That the following works of improvement for the benefit of navigation and the control of destructive floodwaters and other purposes are hereby adopted and authorized in the interest of the national security and with a view toward providing an adequate reservoir of useful and worthy public works for the post-war construction program, to be prosecuted under the direction of the Secretary of War and supervision of the Chief of Engineers in accordance with the plans in the respective reports hereinafter designated and subject to the conditions set forth therein: *Provided*, That the necessary plans, specifications, and preliminary work may be prosecuted during the war, with funds from appropriations heretofore or hereafter made for flood control, so as to be ready for rapid inauguration of a post-war program of construction: *Provided further*, That when the existing critical situation with respect to materials, equipment, and manpower no longer exists, and in any event not later than immediately following the cessation of hostilities in the present war, the projects herein authorized shall be initiated as expeditiously as may be consistent with budgetary requirements and shall be prosecuted vigorously during the period of post-war reconversion: *And provided further*, That penstocks and other similar facilities adapted to possible future use in the development of hydroelectric power shall be installed in any dam herein authorized when approved by the Secretary of War on the recommendation of the Chief of Engineers and the Federal Power Commission.

SEC. 8. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys for flood control and allied purposes, including channel and major drainage improvements, to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its Territorial possessions, which include the following-named localities, * * *.

RESERVOIRS, LEVEES, AND WALLS FOR FLOOD CONTROL

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EXISTING LAW

(Flood Control Act, approved June 28, 1938, 52 Stat. 1225)

SEC. 7. That in order to effectuate the policy declared in sections one and two of the Act of June 22, 1936 (Public, Numbered 738, Seventy-fourth Congress), and to correlate the program for the improvement of rivers and other waterways by the Department of War with the program for the improvement of watersheds by the Department of Agriculture, works of improvement for measures of run-off and water-flow retardation and soil-erosion prevention on the watersheds of waterways, for which works of improvement for the benefit of navigation and the control of destructive floodwaters and other provisions have been adopted and authorized to be prosecuted under the direction of the Secretary of War and supervision of the Chief of Engineers, are hereby authorized to be prosecuted by the Department of Agriculture under the direction of the Secretary of Agriculture and in accordance with plans approved by him. For prosecuting said work and measures there is hereby authorized to be appropriated the sum of \$10,000,000 to be expended at the rate of \$2,000,000 per annum during the five-year period ending June 30, 1944: *Provided*, That such works and measures which are herein authorized to be prosecuted by the Department of Agriculture may be carried out on the watersheds of the Rio Grande and Pecos Rivers subject to the proviso in section 2 of the said Act of June 22, 1936.

THIS BILL

SEC. 11. That the balance remaining from the authorization of \$10,000,000 provided in section 7 of the Flood Control Act approved June 28, 1938, for the five-year period ending June 30, 1944, to correlate the program for the improvement of watersheds by the Department of Agriculture for measures of run-off and waterflow retardation and soil-erosion prevention on the watersheds with the program for the improvement of rivers and other waterways by the Department of War is hereby reauthorized to be expended during the post-war period by the Department of Agriculture for the prosecution of the work authorized in section 10 of this Act: *Provided*, That not more than 20 per centum of the authorization made available herein shall be expended on any one project.

SEC. 12. That section 7 of the Act of June 28, 1938 (Public, Numbered 761, Seventy-fifth Congress), is hereby amended by adding at the end of the first sentence thereof the following: "The Secretary of Agriculture is hereby authorized in his discretion to undertake such emergency measures for run-off retardation and soil-erosion prevention as may be needed to safeguard lives and property from floods and the products of erosion on any watershed whenever fire or any other natural element or force has caused a sudden impairment of that watershed: *Provided*, That not to exceed \$100,000 out of any funds heretofore or hereafter appropriated for the prosecution by the Secretary of Agriculture of works of improvement or measures for run-off and waterflow retardation and soil-erosion prevention on watersheds may be expended during any one fiscal year for such emergency measures."

