

HOMME RESERVOIR  
PARK RIVER, NORTH DAKOTA

MASTER RECREATION PLAN



ST. PAUL DISTRICT  
CORPS OF ENGINEERS, U. S. ARMY  
ST. PAUL, MINNESOTA  
MARCH 1952

CORPS OF ENGINEERS, U. S. ARMY  
Office of the District Engineer  
ST. PAUL DISTRICT  
1217 U. S. Post Office and Custom House  
St. Paul 1, Minnesota

NCPGR

21 March 1955

Mr. Henry W. Harich  
Chief, Reservoir Regulating Section

Dear Mr. Harich:

Inclosed, for your use and reference, is a copy of the Master Recreation Plan for Homme Reservoir on Park River, North Dakota. The master plan was prepared in 1952, but its distribution was inadvertently withheld.

The purpose of the master plan is to guide the operation and the control of activities which affect the uses, development, and treatment of land and water areas and the resources within the project limits. The master plan is designed to provide only the broad general guide lines for reservoir management and may be revised from time to time as necessary to fit changed conditions not foreseen at the time of its initial formulation.

Any suggestions you may wish to make regarding the master plan will be appreciated.

Sincerely yours,

1 Incl  
Cy Homme Master  
Rec. Plan

OTTO J. ROHDE  
Colonel, Corps of Engineers  
District Engineer

MASTER RECREATION PLAN

HOMME RESERVOIR

PARK RIVER, NORTH DAKOTA

CORPS OF ENGINEERS, U. S. ARMY  
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St. Paul 1, Minnesota  
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### A MASTER PLAN FOR RECREATIONAL DEVELOPMENT OF HOMME RESERVOIR PARK RIVER, NORTH DAKOTA

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## I - INTRODUCTION

1. Authority. - This report is submitted in compliance with instructions contained in paragraph 4224.07 of Orders and Regulations which directs that "Upon approval by the Chief of Engineers of recreational development features in a definite project report or preliminary report in lieu thereof, the District Engineer will prepare and submit for approval of the Chief of Engineers a master recreation plan for the project prior to undertaking actual recreational development. \* \* \*." A preliminary report covering the need for recreational development in the authorized Park River Reservoir area was submitted by the District Engineer on 27 February 1948 and preparation of a Master Recreation Plan was authorized by the Chief of Engineers on 24 March 1948. Basic authority whereby the Department of the Army is authorized to construct, operate, and maintain public park and recreational facilities is contained in section 4 of the 1944 Flood Control Act as amended by section 4 of the 1946 Flood Control Act.

2. Scope. - This report includes a description of the project area, a brief outline of the resources of the region, and data relating to factors influencing recreational development. Plans for the initial and ultimate recreational development of the reservoir area are presented together with a summary of improvements desired and data on the extent of cooperation and coordination with governmental agencies and public interests. The recreational plan, through a progressive and orderly development of recreational features in the reservoir area, is designed to permit maximum benefits to the general public consistent with the operation and maintenance of the project for its primary purposes, flood control and water supply and pollution abatement. Estimates of costs for initial and ultimate development and recommendations as to the administration of the program are included in the report.

3. Related reports. - General information relating to the authorized project is contained in the survey report, dated 13 November 1941, published in Senate Document No. 194, 78th Congress, 2d session. More detailed data are available in the definite project report, dated 1 May 1947, which was approved by the Chief of Engineers on 28 August 1947 subject to certain minor revisions subsequently incorporated in the project plans. Inasmuch as the definite project report did not include consideration of the recreational possibilities of the project, a preliminary recreational report, which served as the basis for authorization of this report, was prepared.

4. Authorized project. - The Park River project includes a dam and dual-purpose storage reservoir on the South Branch of Park River authorized by the Flood Control Act approved 22 December

1944 and designated as Homme Reservoir and Dam by Congressional action in 1948. The reservoir will be operated primarily to control spring floods and to supplement low flows in the interest of water supply and pollution abatement downstream.

## II - DESCRIPTION

5. Location. - Park River is tributary to Red River of the North and is located in the northeastern part of North Dakota about 35 miles south of the international boundary. The drainage area embraces the northern half of Walsh County and extends north and west into Pembina and Cavalier Counties. Homme Dam is located on the South Branch of Park River, as shown on plate 1, about 4 river miles upstream from the city of Park River and 62.1 river miles above the mouth of the main stem.

6. Project area. - The drainage area above the reservoir is estimated at 265 square miles and extends from the dam in a north-westerly direction approximately 35 miles with an average width of about 7.5 miles. The physical characteristics of the drainage area vary widely. The headwaters are located in the drift prairie where channel banks are poorly defined. Near the lower end of the drift prairie a well defined valley has been formed which continues through an escarpment area a distance of about 25 miles to the city of Park River. In this reach, which includes the reservoir, the valley is about 75 to 100 feet deep and approximately one-half mile wide. Streams in the area are normally dry except during spring run-off and following heavy rains.

7. Accessibility. - U. S. Highway No. 81 passes through Grafton, N. Dak., approximately 18 miles east of the reservoir, and is intersected at that point by State Highway No. 17 which passes through the city of Park River and continues westward about one-quarter mile south of the reservoir. A county road parallels State Highway No. 17 one mile to the north on the opposite side of the reservoir. A graveled access road from the county road has been constructed to the north abutment of the dam as part of the project. Project lands include a strip of land for access purposes from State Highway No. 17 to the south abutment of the dam. During the construction period, contractor forces maintained a road at this location for access purposes. Railroad transportation in the general area is provided by the Great Northern Railway, the Northern Pacific Railway, and the Minneapolis, St. Paul and Sault Ste. Marie Railroad. There are no commercial airports in the Park River basin, but local air traffic utilizes the facilities of small airports at Park River and Grafton.

8. Population. - The 1950 population census indicates that approximately 25,000 persons live within a 25-mile radius of the reservoir, representing a population density of about 13 persons per square mile. Grafton with a population of 4,901 and Park River with 1,692 residents are the largest communities in the immediate area. Grand Forks, N. Dak., located about 50 miles

southeast of the reservoir, had a population of 26,836 in 1950. During the period, 1940-1950, the rural population within the 25-mile radius of the reservoir decreased about 23 percent while the population of incorporated communities increased about 11 percent.

9. Geology and soils. - The soils of the drift prairie in which the reservoir is located are derived from boulder clay and till deposited by the glaciers which once covered the entire area and are predominantly dark grayish-brown silt and clay loams. Downstream from the reservoir area are found the lacustrine and alluvial soils which are associated with the ancient glacial Lake Agassiz which once occupied the Red River of the North valley. The soils of the basin are very fertile and are cultivated extensively. Well records indicate that the glacial material extends to depths of 300 feet and overlies sandstone and limestone formations.

10. Climate. - According to U. S. Weather Bureau records, the mean annual temperature at Park River, N. Dak., is about 39° F. with extreme daily temperatures of -51° and +112° F. having been recorded in the basin. The average frost-free period is limited to about 125 days in the basin but is generally favorable to crop growth due to the long summer days and the high percentage of sunshine. Annual precipitation at Park River averages about 17.5 inches and varies from a low of about 11 inches to a maximum of about 28 inches. Snow usually falls from November to April and accounts for approximately 20 percent of the annual precipitation.

11. Stream flow. - Stream-flow records on Park River for the U. S. Geological Survey station at Grafton, N. Dak., cover the period from April 1931 to date, and similar records are available on the South Branch near Park River for a period of about 11 years. Flows on the South Branch are characterized by a period of relatively high flow during spring breakup after which the flow gradually decreases and becomes intermittent in June and succeeding months. The average discharge for the 10-year period from 1936 to 1946 at Grafton was 33.1 second-feet. Periods of no flow have been recorded many times at both stations. At Park River, a maximum flow of 11,000 second-feet was recorded 18 April 1948, whereas at Grafton, the peak discharge of 12,600 second-feet was recorded 19 April 1950.

12. Recreational resources. - Native trees including elm, box elder, ash, basswood, cottonwood and oak grow abundantly along the banks of Park River. Shrubs such as chokecherry, hazel, wild rose, and snowberry also grow thickly where grazing is not excessive. Native wildlife include deer, grouse, and waterfowl of many species. At the present time, Park River supports a relatively poor sport fishery. Few game fish are taken and catches are confined mainly to small rough fish. Data on game animals and birds, information on hunting and fishing success, and pertinent related economic data in the general reservoir area have been obtained by the U. S. Fish and Wildlife Service and are included in appendix A.

### III - PROJECT

13. Structures. - Homme Dam is an earth-fill structure having an over-all length of about 865 feet and a maximum height of approximately 67 feet. Principal related structures include an overflow-type uncontrolled spillway located on the right bank adjacent to the embankment, a low water control conduit and control tower near the left bank, and a 16-inch diameter pipe through the dam for possible future extension to serve municipal water supply. The spillway has a length of 150 feet with the crest at elevation 1080.0\*, 19 feet below the top of dam. Flood flows exceeding reservoir capacity will discharge over the uncontrolled spillway into a stilling basin below the dam. The outlet works for reservoir regulation during low flow periods include the control tower, concrete conduit, chute spillway and stilling basin. The reinforced concrete control tower is 56 feet in height and provides two gate wells and a water supply valve well, each having an inside dimension 4 feet 4 inches square. Outflow through the 5-foot diameter conduit is controlled by two 3 by 5-foot slide gates with duplicate gates for emergency closure. The valve well is constructed integral with the gate wells and houses two 16-inch double-disc gate valves for service and emergency control of the water supply line. Access to the control tower from the left bank is provided by a bridge approximately 85 feet long.

14. Reservoir. - At normal full pool, elevation 1080.0, the reservoir forms a lake having a surface area of about 194 acres and a shoreline of about 4.1 miles. At this stage, the lake is approximately 2,000 feet in width at the widest point and extends about 1.3 miles above the dam. At minimum pool elevation (1053.5), the reservoir area is reduced to about 50 acres and the length of shoreline to about 1.1 miles. Reservoir capacity varies from 3,650 acre-feet at normal full-pool elevation to 270 acre-feet at minimum pool elevation. The reservoir was first filled in 1951 following the spring run-off.

15. Operation. - Normal reservoir operational procedure provides for draw-down during the period 1 November to 1 March to a maximum elevation of 1074.0, thus providing at least 6 feet of flood control storage at the time of spring breakup. When snow cover on the tributary area indicates a large potential spring run-off, additional storage capacity will be provided by continuing the draw-down in March, if warranted, but not below the minimum conservation pool, elevation 1053.5. During the spring run-off

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\*All elevations referred to in this report are mean sea level datum, 1929 adjustment.

period, the reservoir will be regulated to assure recovery to normal full-pool elevation. Following the spring run-off period, water will be released as required to meet downstream water needs. During years of extremely low flows, such as those experienced in 1939 and 1940, the reservoir operation will be modified. If snow cover on the ground about 1 March should indicate that the expected spring run-off will not be sufficient to fill the reservoir, releases will be reduced as warranted by the prospective deficiency. Operational studies indicate that, during years of normal or above normal run-off, the pool level will remain at or only slightly below normal pool elevation (1080.0) prior to 1 September, thereby giving reasonable assurance of fairly constant pool levels during the summer recreational season.

16. Siltation. - Available data indicate that the South Branch of Park River transports little silt except during the relatively short periods of spring run-off. This fact is confirmed by the lack of silt deposition behind existing small dams on the stream. Provision for limited silt deposition has been made by placing the conduit invert at elevation 1048.0, thus allowing 100 acre-feet for sedimentation.

#### IV - FACTORS AFFECTING RECREATIONAL DEVELOPMENT

17. Existing recreational facilities. - There are no lakes or reservoirs suitable for recreational purposes within a distance of 50 miles of Homme Reservoir. Lake Ardoch National Wildlife Refuge, located on Forest River about 25 miles southeast of Park River, and Pioneer Lake National Wildlife Refuge, about 30 miles southwest of Park River, are not suitable for fishing, swimming, or boating due to the shallow and alkaline character of the lakes. Devils Lake which lies about 50 miles southwest of Park River was once a highly developed recreational center, but the decline in lake stage since about 1870 and the increase in salinity have reduced the recreational value of the area. However, the present approved project on Missouri River includes a provision for the diversion of water from the Missouri Basin into Devils Lake to partially restore lake levels. Lake Bronson, on Two Rivers in northwestern Minnesota, is the nearest attractive body of water, but its patronage by residents of the Park River area is limited since the lake is about 80 miles away and fishing is permitted only after purchase of a non-resident license.

18. Other proposed reservoir projects. - The report on Pembina River and tributaries contained in House Document No. 565, 78th Congress, 2d session, recommended that a project be adopted for the construction of two dual-purpose flood-control and water-conservation reservoirs, one on Pembina River at mile 96.9 and the other on Tongue River at mile 60.2. The two reservoirs were authorized for construction by section 10 of the 1944 Flood Control Act. However, a review of the above report in compliance with a resolution by the Committee on Commerce, United States Senate, adopted 28 February 1945, has been initiated.

19. Recreational habits of local people. - The recreational habits and interests of the residents of the Park River area center principally around picnicking, swimming, weekend outings, winter sports, hunting, and fishing. Large family picnics and family reunions have been known to overtax the facilities of the small city parks at Grafton and Park River. Crowds of 2,500 to 3,000 persons have been reported at the Grafton park on several occasions. The average Sunday attendance at the parks in Park River and Grafton during the recreational season exceeds 100 persons, indicating that the residents of the area appreciate the value of public parks and make maximum use of available facilities. During the summer of 1951 when a full pool was first attained, it has been reported that on several weekends, as many as 300 persons visited the reservoir even though no recreational facilities, except the swimming beaches, were available. At the present time, fishermen travel many miles to the lakes in northwestern Minnesota in order to obtain good fishing. Local fishing enthusiasts report that they make these

trips several times a year. Others maintain summer homes on Minnesota lakes. Local duck hunters travel 50 to 100 miles west of Park River since the lack of surface waters in the region provides little inducement for migratory waterfowl to use the area. Deer hunting is occasionally good along the escarpment area near Park River.

20. Factors favorable to recreational development. - The most significant factor indicating that the reservoir will develop as an important recreational attraction in the region is the lack of existing public use areas within a reasonable distance of the project. The proposed method of operation which, under normal conditions, will result in little draw-down during summer months is favorable to recreational use of the reservoir. Also favorable is the probability that the reservoir will support certain species of fish which will produce a heavy fishing pressure. Use of the reservoir by migratory waterfowl is also foreseen as a factor which may attract sportsmen to the vicinity of the project and favor its recreational development.

21. Factors unfavorable to recreational development. - The selection of areas suitable for recreational development is somewhat limited by the relatively small size of the project and the small amount of property acquired for the operation of the project. In addition, operational studies indicate that, during years of exceedingly low run-off, the pool may reach low stages which would temporarily reduce the recreational value of the project.

V - IMPROVEMENTS DESIRED

22. Public meeting. - A public meeting was held at Park River, N. Dak., on 27 May 1948 and was attended by about 74 persons including representatives of county and local agencies and interested individuals. At this meeting the potential recreational advantages of the reservoir were outlined, and the local people were invited to discuss the need for recreational areas and to present suggestions relating to the future management of public-use areas. Local persons expressed their definite interest and need for recreational areas in the region and suggested that management of public-use areas be undertaken by the Walsh County American Legion posts. Legion representatives pointed out that they could reorganize their existing recreational association, which was then inactive, and undertake the management responsibilities.

23. Other meetings. - Local interests and representatives of the Corps of Engineers undertook a joint reconnaissance of the reservoir area on 8 August 1948. The local group included individuals representing the American Legion, Boy Scouts of America, Future Farmers of America, and several sportsmen's organizations. Potential recreational sites were visited and opinions of the group obtained relating to the development of the sites. Later, on 12 September 1949, the general plan of improvement was discussed with local interests at a public meeting at Park River.

24. Suggested improvements. - Local interests repeatedly expressed their desires to have the reservoir area developed to facilitate boating, swimming, fishing, and picnicking in particular. Leaders of youth organizations pointed out the need for suitable group camp facilities in the area and suggested inclusion of such a camp area in the reservoir development plan. In addition, the Park River Ski Club has indicated its plans to construct a ski slide at the reservoir which would increase the winter use of the area.

VI - COLLABORATION WITH INTERESTED AGENCIES

25. U. S. Fish and Wildlife Service. - The views and suggestions of the U. S. Fish and Wildlife Service relating to the development and management of the reservoir with respect to the present and potential fish and wildlife resources are contained in a report dated 25 May 1948 (appendix A). The report summarizes briefly pertinent features of the project, presents data on present and future fish and wildlife resources, includes a tabulation of annual fish and wildlife values, and concludes with specific recommendations covering reservoir regulation and management. Principal recommendations include substitution of a 50-acre minimum pool in place of the 20-acre minimum pool proposed in the definite project report, clearing of reservoir lands only up to elevation 1082.0, and fencing of government lands to restrict grazing. With the exception of the proposal for fencing, the recommendations of the U. S. Fish and Wildlife Service were included in the project plan.

26. National Park Service. - A brief report by the National Park Service, dated October 1947, based upon a field inspection of the project area, was furnished with the preliminary recreational report together with subsequent comments relating to proposed recreational development of the area near the upper end of the reservoir. The report recommends that recreational values resulting from construction of the project be made available for public use and enjoyment through development of facilities to permit reasonable use of the area. Further recommendations relate to provisions for public access, future expansion, parkway construction, and administration. In comments dated 10 November 1947, the National Park Service recommends against development of the area at the upper end of the reservoir or, if improved for recreation, that the development be limited and include provision of an access road.

27. Smithsonian Institution. - An appraisal of the archeological resources of Homme Reservoir was made by the Smithsonian Institution in September 1948. The survey was made primarily to discover the extent of archeological remains in the area to be flooded and to determine whether there were any sites of major importance which should be excavated prior to the filling of the reservoir. In a brief report dated December 1948, the River Basins Surveys, Smithsonian Institution, noted that no sites were discovered within the reservoir area.

28. Local agencies. - The state policy regarding development and management of reservoir lands has been discussed with the Governor and a state committee composed of the heads of interested state agencies. In general, the state favors improvement of reservoir recreation areas

at rates commensurable with actual public needs and advocates sponsorship of such areas by responsible local communities, groups, or organizations except where such functions are specifically retained under Federal or state control. The general plan of improvement has been furnished to the state committee. Participation by the state will consist of cooperation in management to the extent that normal functions of existing state agencies are involved (law enforcement, protection of public health, and fish and wildlife management). However, the state has definitely declined to accept management responsibility as a sponsoring agency. All other local governmental or semi-public agencies, with the exception of the Walsh County American Legion Association, have similarly declined sponsorship of the recreation area.

29. Public health agencies. - The North Dakota Health Department and the Walsh County Board of Health were contacted to determine their views on swimming in the reservoir, since water stored in the reservoir would be used for water supply. No definite stand was taken by the State Health Department which indicated that the matter was one for local health authorities to consider. A letter from the County Board of Health approving swimming in the reservoir is included as appendix B.

30. Walsh County American Legion Posts. - In an action taken in August 1948, the 11 American Legion Posts of Walsh County sanctioned and approved the establishment of an organization called the "Walsh County American Legion Association" to aid in promoting development of the recreation program at Homme Reservoir. This association has indicated a desire to construct facilities and manage the recreation areas under a lease with the Department of the Army. The proposed recreation plan for the reservoir has been discussed with representatives of this association and their suggestions included in the program where possible. The association sponsored an outboard-boat racing program at the reservoir on 9 September 1951 to acquaint the local people with the recreational possibilities of the project. More than 2,500 persons witnessed the races and enjoyed family picnics in the project area. Photograph No. 1, appendix C, shows a view of one of the races.

31. Walsh County Wildlife Federation. - This group is an organization of local sportsmen interested in conservation and wildlife activities. Recommendations regarding wildlife aspects of the reservoir have been made by the organization, and representatives have indicated that the group will cooperate with responsible state authorities in formulating fish and game management plans.

32. Activities of state agencies. - The Corps of Engineers is cooperating with the North Dakota Game and Fish Department in a research program through the North Dakota Reservoir Use Advisory Committee which is composed of representatives of Federal and state agencies and

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university groups interested in the development of wildlife resources. Pre-impoundment investigations have included data secured by the U. S. Fish and Wildlife Service and by Professor George C. Wheeler of the Department of Biology, University of North Dakota. Professor Wheeler's survey, made in July and August 1949, revealed the presence of numerous forage minnows and the absence of rough and game fish within the reservoir area. Post-impoundment investigations will be made as a continuation of the previous study. The North Dakota Game and Fish Department has made a number of investigations in the project area and is actively cooperating in the development of a plan for game and fish management. This agency has reviewed the preliminary recreation report on Homme Reservoir and has indicated general concurrence with the recreational improvements proposed. The Game and Fish Department made an initial planting of 23,400 large-mouth bass fingerlings in the reservoir in 1950. This was followed by plantings in 1951 of 1,500,000 walleyed pike fry, 41,000 bluegill fingerlings, and 1,500 large-mouth bass fingerlings.

## VII - PLAN OF IMPROVEMENT

33. General. - The plan of improvement provides for both initial and ultimate development and is designed to permit an orderly transition from the initial improvement to the ultimate development as the need for the further improvement becomes apparent and public benefits justify such further works. Two locations having desirable recreational features have been selected for development after due consideration of the desires of local interests and suggestions of interested agencies. The areas proposed for improvement include Grand View Point, an area overlooking the dam site and reservoir, and Walsh Memorial Beach, a general public-use area. No development of public-use areas will be permitted unless water supply and sanitary facilities are first provided either by the Federal government or by other interests. Another area, referred to as Youth Haven, might ultimately prove to be desirable. The recreational area locations are shown on plate 2 and principal features of each proposed development are shown on plate 3.

34. Grand View Point. - This area, consisting of about 9 acres located on high ground overlooking the reservoir near the south end of the dam, would provide essential facilities at the most advantageous point for the public to view the dam and reservoir. The initial development includes provision of a short access road leading northward from State Highway No. 17, a parking area, water supply (well and hand pump), minimum toilet facilities, a protective fence above the steep bluff in the area, and warning signs. An existing road from high ground to the pool could be improved to permit access to the small bay in the area by fishermen and others who wish to keep boats at this location. Local interests would provide the necessary boat-handling facilities at this location. Picnic tables, fireplaces, and garbage and trash disposal facilities could be provided by local interests as the need develops. In addition, local people are considering construction of a road and bridge on government-owned lands a short distance downstream from the dam to permit travel between this area and the north side of the reservoir. Photograph No. 1, appendix C, shows a view of the impoundment from Grand View Point.

35. Walsh Memorial Beach. - This area of about 35 acres located along the north shore of the reservoir would be the principal public-use area. Most of the land is covered by a good stand of hardwood trees and a larger portion of the tract includes high land with both gradual and steep slopes to the water. The initial development would include a short access road, parking space, water supply (well and hand pump), and minimum toilet facilities. In addition, warning and directional signs and a protective fence are needed in the area. The fence is necessary to protect the public from approaching too close

to the almost vertical bluff above deep water in the south-central portion of the tract. The grading and placing of a gravel blanket at the bathing beach site have been completed. If there is a need for picnic facilities in the future the area north of the swimming beach has suitable features for an expansion of the picnic grounds to this part of the tract. It is anticipated that the area might be used for winter sports, and a warming house which could be constructed by the local sponsoring agency would add to the comfort of winter-sports participants and spectators. The local sponsoring agency would provide picnic tables, fireplaces, garbage and trash disposal facilities, the bathhouse, bathing beach appurtenances, life guard personnel, and suitable boat-handling facilities. Photographs Nos. 2 through 6, appendix C, show views at Walsh Memorial Beach.

36. Youth Haven. - This area, including 27 acres along the south shore near the upper end of the reservoir, might ultimately be developed for day use and overnight camping activities of organized youth groups. The camp site is located on a high wooded bluff isolated from other proposed public-use areas and would be used initially as a public access point. A bathing beach at this site has been completed. In addition, the channel between the main reservoir and the lagoon west of the camp site has been opened to prevent water from collecting in the pond during periods of low reservoir stage. If developed, local interests would improve the access road from State Highway No. 17 to the project boundary and would construct added facilities as required.

37. Area below dam. - The area below the dam includes approximately 21 acres. It is expected that only limited use of the area will be made by fishermen and visitors viewing the outlet structure. Therefore, it is proposed to hold this area in reserve for possible future public-use development by the local sponsoring agency. Access to the area may be obtained by using the project access road to the north abutment of the dam. If local interests construct a road downstream from the dam, as proposed in the development of Grand View Point, greater use of the area will probably result and may warrant the provision of minor public-use facilities by the local agency. No public-use facilities in this area are planned to be constructed by the government with Federal funds.

38. Private developments. - Aside from two, or possibly three, areas proposed for public-use development, there are no government-owned lands suitable for private or commercial development. It appears probable that local interests may construct private summer cottages on lands adjacent to government land. In such cases, access to the reservoir over the Federally-owned lands and maintenance of private boat landings will be permitted subject to regulations prescribed by the District Engineer.

39. Agricultural and grazing lands. - With the exception of a few acres of land near the upper reaches of the pool, no project lands are suitable for leasing as cropland. It is probable that even these small fields will not be tillable due to ground water conditions. Other project lands outside the recreational areas are too steep and too limited in area to permit grazing or pasturing. The type of farming in the vicinity of the reservoir is such that access to river or lake water supply is not an important factor. Therefore, in view of a policy of good land management and soil conservation, it is considered desirable that no agricultural or grazing leases of project lands be made.

40. Local opinion. - Proposed recreational plans for the project were shown to interested parties at a public meeting at Park River on 12 September 1949. The meeting was attended by approximately 60 persons including interested individuals and representatives of county and local organizations. Plans for the initial and ultimate development with Federal funds and proposed improvements to be constructed with private funds were discussed. Those present indicated their unanimous endorsement and whole-hearted support of the proposed public-use program. As an indication of their particular interest in the entire public-use development program at the reservoir, the local people pointed out that during the year they sent about twenty individuals to the life-saving and water-safety school conducted by the American Red Cross at Jamestown, N. Dak., preparatory to public use of the reservoir.

### VIII - GENERAL POLICIES AND ADMINISTRATION

41. Policy. - The general policy with regard to the development of the reservoir and surrounding government-owned land is to provide the maximum recreational opportunity to the general public through an orderly and planned development consistent with the operation of the project for its primary purposes of flood control and low flow improvement. In accordance with this policy two sites have been selected for improvement in the public interest and a program outlined which would provide sufficient initial facilities to meet present recreational needs and permit an orderly development in the future as the need becomes apparent. The plan of recreational development is not to be considered as fixed and unchangeable but rather as an initial plan which can be altered and expanded as the future needs and desires of the public require. The public use made of recreational developments under the plan will be studied to determine if certain facilities, after being established, should be enlarged or abandoned, and if new areas should be developed. It is the intention to make the public land available for its best use for the greatest benefit to the general public.

42. Facilities to be provided by the government will be limited to those which are for the use and protection of the public and not operated for profit. Such facilities will include access roads and trails, parking areas, necessary fencing and water supply and sanitary facilities. Standards of construction shall be kept uniformly high both in regard to facilities constructed by the government and those constructed under permits or leases.

43. The maintenance of access roads at government expense shall be confined to those necessary in connection with the operation of the reservoir. Approach roads leading from public roads and highways to the recreational areas will be constructed and maintained by the state, county, or township in which the respective areas are situated. Where practicable, cooperative agreements shall be worked out with the state or county for maintenance of access roads, turn-arounds, and parking areas on government-owned lands.

44. Lands allocated for recreational development may be leased or licensed for that purpose provided that preference is given to Federal, state, or local governmental agencies. Licenses may be granted to such agencies without monetary consideration when such action is determined to be in the public interest. Leases to nonprofit organizations may be granted at reduced or nominal rentals in recognition of the public service to be rendered in utilizing the leased premises.

45. Leases or licenses for commercial-recreational purposes to individuals or groups of individuals will be granted only after

advertising or otherwise giving all interested parties an equal opportunity to obtain the same privilege. Preference for this type of lease shall not be given to former owners, their heirs, legal representatives of lessees, or to the owners of lessees of adjoining property. Commercial enterprises must be operated by the lessees in a manner to meet the reasonable needs of the public. Prices to be charged for facilities and services provided by concessionaires will be fair and subject to approval of the District Engineer.

46. The interest of the general public will be safeguarded by adequate control over the use of government-owned land in the reservoir area. The public will have access to and use of the reservoir, and pedestrian access will be maintained along the entire shoreline, except in special cases as determined by the District Engineer. Exclusive access across government-owned land by adjacent property owners will not be permitted. Access roads and docks of a quasi-public nature will be permitted provided that the nature and extent of such facilities are such that they can be considered as fulfilling a demand that is harmonious with the over-all development and not in conflict with the public interest. Automobile access to the reservoir on government-owned lands will be permitted only over open public and reservoir roads. The shore of the reservoir will be retained in its present natural state except that improvements of an aesthetic nature or those necessary to make facilities available to the public will be permitted.

47. Boats of all classes will be operated under rules and regulations considered necessary to insure safe boating practices. Boats may be temporarily anchored at any point along the shore of the reservoir, except in certain restricted areas, but boat docks or mooring devices will be permitted only at approved locations. Permits will be issued free of charge and will be required for each boat placed on the reservoir for any one period longer than three days. No houseboats will be permitted on the reservoir. Permits will be required for all landings, docks, and moorings placed in the project area and will be valid for only those areas designated in the permit. Permits for boats used for commercial purposes will be provided for in the lease or license contract under which all commercial activities will be authorized and will be for the period of the lease or contract.

48. The Corps of Engineers will cooperate fully with all local law enforcement officers and lease holders and licensees will be required to do likewise. Particular attention will be given to cooperation with officers of the State of North Dakota responsible for the enforcement of laws relative to fish and game, public health and sanitation, and prevention of stream pollution. Provision of police and fire protection for private property on government-owned lands will be the responsibility of the lessee. It will be the responsibility of the lessee to permit no infraction of the terms of his lease by others.

49. Administration. - The administration of the Corps of Engineers recreational program for Homme Reservoir and Dam will be carried out in accordance with existing legislative authority, policies, and regulations. The District Engineer's functions will include but not be limited to the following:

a. Prepare all planning reports, cost estimates, and construction plans and carry out all Federal construction.

b. Coordinate all phases of the program with state and local governmental agencies and local interests and with regional offices of the interested Federal agencies.

c. Determine which areas should be leased for various purposes, when those areas should be made available for leasing, and conditions which should be incorporated in leases or licenses.

d. Prepare and submit drafts of rules and regulations for the control of the use of lands to be prescribed by the Secretary of the Army.

e. Supervise the use of lands for which leases and licenses are executed, including approval of all construction on subject lands and inspection of the premises as frequently as deemed advisable.

50. The "Rules and Regulations Governing Public Use of Certain Reservoir Areas" contained in title 36, chapter III, part 311 of the Code of Federal Regulations should be adopted for Homme Reservoir with the following modifications:

"311.4 - The operation of houseboats on the reservoir will not be permitted.

"311.6 (b) - Hunting shall be with a shotgun only.

(c) - A permit shall be obtained from the District Engineer or his authorized representative to construct any duckblind in the reservoir area.

"311.8 - Picnicking is permitted except in prohibited areas designated by the District Engineer or his authorized representative.

"311.11 - Loaded rifles, loaded shotguns, loaded pistols, and explosives of any kind are prohibited in the area, except when in possession of a law enforcement officer or government employee on official duty, when shotguns are being used for hunting during the hunting season as permitted under "Hunting and Fishing" above, and when specifically authorized by the District Engineer.

"311.17 - Delete."

The enforcement of civil and criminal laws within the reservoir area will remain the responsibility of the duly constituted officers of Federal, state, and local governments. The Corps of Engineers will cooperate with all local law enforcement officers. Particular attention will be given to cooperation with the officers who are responsible for the enforcement of the laws relative to game and fish, forest conservation, public health and sanitation, and prevention of pollution. Enforcement of departmental rules and regulations will be effected in all cases where practicable without resorting to force.

## IX - DISCUSSION

51. The need for recreational development at Homme Reservoir is clearly established and is supported by the findings of the National Park Service which has noted the lack of suitable recreational areas within a 50-mile radius of the project. The need for more recreational areas in the northeastern part of North Dakota is pointed out in the "North Dakota Park and Recreational Area Plan" prepared in 1939 by the State Park Committee and the State Planning Board in cooperation with the National Park Service. From the interest shown by affected state agencies and local interests, it is apparent that the potential recreational advantages of the project warrant development to aid in a program for recreational improvement in the region.

52. In general, areas selected for improvement meet with the approval of interested Federal and state agencies and conform closely with the desires of local interests. The National Park Service, while concurring generally in the improvement of Grand View Point and Walsh Memorial Beach, notes certain features of the Youth Haven area which might not favor recreational use. However, local interests believe that youth groups may make considerable use of the site for organized camping activities.

53. The local people have exhibited a great amount of interest in the master plan throughout its development and, through the Walsh County American Legion Association, have repeatedly indicated their willingness to manage and maintain government-constructed, public-use facilities at their own expense. Since there will be no full-time operational employees stationed at the dam, considerable savings will result to the government through management and maintenance by a local sponsoring agency. However, periodic inspections of the area by the dam tender stationed at Baldhill Dam and Lake Ashtabula will be made in the interests of health and safety. Despoilment of the recreation areas or their possible misuse would be referred to the sponsoring agency for necessary action. Possibilities of extensive damage from fires are small due to the limited vegetative cover in this vicinity. Local agencies, in their management of recreational development areas, would be required to enforce camping and fire-building regulations. It is believed that such elimination of practically all Federal annual costs for management and maintenance of recreational areas amply justifies the Federal participation proposed.

## X - RECOMMENDATION

54. In view of the established need for public-use areas in the general region and the potential recreational advantages of Homme Reservoir, it is recommended that, in addition to the facilities already provided, the initial development program outlined herein be undertaken and that future developments proposed herein be adopted for completion as the public use of the area develops and the need for such additional improvements becomes apparent.

2 Incl

1. Appendices A and B
2. Plates 1 through 3

L. G. YODER  
Colonel, Corps of Engineers  
District Engineer

APPENDIX A

UNITED STATES DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

Washington 25, D. C.

A report on Fish and Wildlife Resources in Relation

to the

Water Development Plan for the

Park River Reservoir on the South Branch of the Park River

Red River of the North Subbasin

Upper Mississippi Red River Basin

Sponsored by : Department of the Army, Corps of Engineers  
in compliance with Flood Control Act  
approved December 19, 1944.

Source of Engineering Data : Sponsor's Definite Project Report,  
dated May 1, 1947.

Situated in : Walsh County, North Dakota.

Field Investigation : November 1947.

Report Prepared : November-December 1947.

Copies of the report are furnished to the St. Paul District Engineer, the North Dakota Game and Fish Department, and the North Dakota Water Conservation Commission. The report is not available for general distribution, but copies are on file in the Central Office of the Service at Washington and the Regional Office at Minneapolis. Interested persons including the press, may read the file copies and make such notes of the contents as they desire.

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Field work and report by River Basin Studies Staff, Fish and Wildlife, Region III, Minneapolis 2, Minnesota: W. A. Elkins, R. W. Sharp, and F. W. Thorstenson.

## INTRODUCTION

The Department of the Army, Corps of Engineers, will construct the Park River Reservoir to provide flood control and water conservation within the Park River Basin. The project calls for the construction of a dam on the South Branch of the Park River near Park River, North Dakota. This report is an evaluation of the present and future fish and wildlife resources within the area affected by the operation of the reservoir.

The North Dakota Game and Fish Department cooperated in the field investigation for this report.

## GENERAL DESCRIPTION

### Area

1. Topography. Park River drainage basin is located in the northeastern corner of North Dakota and lies within Cavalier, Pembina, and Walsh Counties. The stream flows in an easterly direction and is a tributary of the Red River of the North. Small tributary coulees in the headwaters converge to the North, Middle and South Branches, which have an almost common confluence near the city of Grafton. The Pembina escarpment, a range of low-lying hills, divides the watershed into two regions: the flat Red River valley plain on the east and the rolling prairie plateau on the west. Elevations above mean sea level range from about 800 feet in the valley plain to about 1,650 feet in the western extremities of the basin.

2. Physical Characteristics. The Park River drains an area of 1,010 square miles of which 359 square miles are drained by the South Branch. Stream gradients in the escarpment area average from 14 to 18 feet per mile. The stream bottom in this region is rocky and the channel is poorly defined. As the stream enters the flat

valley plain, the slope rapidly becomes less, and near Grafton the gradient is only about 1.5 feet per mile. In the Valley plain, the river has cut a channel 15 to 20 feet deep into the alluvial soil. Stream flow in this reach is sluggish, and the channel contains few natural riffles. Pools are created either by natural debris or by beaver dams. The banks of the stream in the lower reaches are 100 to 125 feet apart, while in the upper reaches of the South Branch the stream width is only about 20 feet, and the stream banks are low.

3. Geology. Continental glaciers covered the Park River Basin and deposited a heterogeneous mass of clay, sand, gravel, and boulders over the area as they receded northward. The Red River valley plain, formerly the bottom of glacial Lake Agassiz, is composed of lacustrine deposits of sediments. Substrata in the valley plain are limestone, sandstones, and shales, overlying formations of granite. Glacial drift overlies deposits of shale and Dakota sandstone in the prairie plateau.

4. Soils. Soils in the valley plain are alluvial deposits of dark gray to black clay loams of the Fargo series. The prairie soils are primarily grayish brown silt and clay loams of glacial origin belonging to the Barnes series. These soils are naturally rich and highly productive.

5. Climate. The Park River Basin has a rigorous climate. Winter temperatures below zero are common and a low of -47° F. has been recorded at Grafton. Summer temperatures are moderate, although the basin has had temperatures as high as 108° F. The average yearly temperature is about 36° F. The mean annual precipitation is about 17.5 inches, but radical departures from this figure are common in the frequent cycles of wet and dry seasons. The frost free period

extends from about May 20 to September 20 limiting the growing season to 120 days.

6. Hydrology. Moderate and erratic precipitation coupled with absorptive prairie soils and dry winds retard run-off in the Park River watershed. Actually, on the average, less than five percent of the precipitation appears as run-off. The recent drouth aggravated this condition, and, during the nine-year period 1932-40, only about 1.5 percent of the precipitation appeared as run-off in the stream. Most of the stream flow originates as snow-melt in the spring and is supplemented by spring rains. Consequently, most of the run-off occurs in the four-month period from March to June. Run-off during the remainder of the year is extremely light, and long periods of no flow occur frequently. Discharge records on the South Branch near Park River (drainage area 255 square miles) for the six-year period 1941-46 show that the extremes in discharge varied from no flow to a maximum of 1,650 second-feet. The average discharge for this period was about 18 second-feet. Discharge records on the Park River at Grafton (drainage area 753 square miles) for the 10-year period 1937-46 show that the extremes in stream flow varied from no flow to 4,310 second-feet. The average discharge for the period of record was about 33 second-feet. The normal low-water flow at both stations was less than 0.2 of a second-foot.

7. Vegetation. The Park River valley supports a mixed growth of hardwood trees and shrub, typical of stream slopes in this region of North Dakota. Two fairly distinct timber types predominate. The valley floor supports a mixture of boxelder, elm, green ash, basswood and ironwood. Grazing is heavy in this type and the understory is limited to scattered patches of wolfberry, wild rose

Juneberry, black haw, chokecherry, wild plum, and hazel. On the steep valley slopes burr oak predominates, with scattered patches of aspen. Lighter grazing in places on these slopes has allowed the maintenance of a better stand and a heavier canopy. Shrub growth consists of light and scattered patches of the same species found in the valley. A vegetation map accompanies this report. Cover type acreages are listed in Table 1.

Table 1. - Cover-type Acreages

| Type               | Minimum pool<br>elev. 1,048 ft.<br>percent |              | Av. ann. min. pool<br>elev. 1,063 ft.<br>percent |              | Max. oper. pool<br>elev. 1,080 ft.<br>percent |              |
|--------------------|--|--------------|--|--------------|---|--------------|
|                    | Acreage of area                            |              | Acreage of area                                  |              | Acreage of area                               |              |
| Corn & small grain | 0  | 0            | 12   | 11.9         | 12  | 6.2          |
| Grassland, grazed  | 0  | 0            | 10   | 9.9          | 23  | 11.8         |
| Hayland            | 0  | 0            | 1  | 1.0          | 2   | 1.0          |
| Upland timber      | 1  | 5.0          | 15   | 14.8         | 37  | 19.1         |
| Bottom-land timber | 16   | 80.0         | 57   | 56.5         | 95  | 49.0         |
| Highland brush     | 0  | 0            | 0  | 0            | 16  | 8.3          |
| Water and channel  | 3  | 15.0         | 6  | 5.9          | 9   | 4.6          |
| <b>Total</b>       | <b>20</b>                                  | <b>100.0</b> | <b>101</b>                                       | <b>100.0</b> | <b>194</b>                                    | <b>100.0</b> |

Project

8. Location. The Park River Dam will be located on the South Branch of the Park River in section 19, T. 157, N., R55 W., in the central part of Walsh County. The damsite is 62.1 river-miles above the mouth of the Park River and about four river-miles upstream from the town of Park River.

9. Purpose. Park River Reservoir will provide storage to reduce flood stages and increase low-water flows in the lower reaches of the South Branch and the Park River. The reservoir will provide a dependable

water supply for the communities of Park River and Grafton, and increased low-water flows will serve to dilute stream pollutants.

10. Dam. The dam will consist of an 865-foot length of earth-fill embankment, a 150-foot concrete gravity section spillway, and a controlled outlet conduit. The embankment will have a crest width of 20 feet and side slopes of 1:3. Riprap will be placed on the upstream slope to elevation 1,088 feet. Exposed upstream and downstream slopes will be sodded. Two berms, provided with intercepting drains, will be constructed on the downstream slope at elevations 1,077 feet and 1,055 feet respectively. The maximum height of the fill will be 66 feet at crest elevation 1,099 feet. Water will flow uncontrolled over the spillway crest at elevation 1,080 feet and descend on a concrete chute to a stilling basin before flowing into the downstream channel. The outlet works will consist of a concrete intake tower, a five-foot diameter concrete conduit 325 feet in length, and a 25-foot stilling basin at the outlet. Flow through the conduit will be controlled by two 3-foot by 4-foot vertical slide gates having a sill elevation of 1,048 feet. A 16-inch cast iron pipe will be installed adjacent to the conduit to provide a direct take-off for a water supply line which will serve Park River and Grafton.

11. Reservoir. The reservoir will extend about 2.25 miles upstream from the dam and will have a maximum width of about 2,000 feet when the water level is at the spillway crest. This maximum operating level at elevation 1,080 feet will provide a storage capacity of 3,650 acre-feet over an area of 194 acres. Water levels will rise above the spillway crest elevation occasionally for short periods of time when the run-off exceeds the available storage capacity. When the reservoir level is lowered to the conduit invert, 1,048 feet, a minimum pool

of 20 acres and 100 acre-feet of storage capacity will remain. The reservoir fishery evaluation in this report is based on the average annual minimum pool at elevation 1,063 feet. Wildlife evaluations are based partially on the maximum operating pool. Pertinent data relative to these pool levels are listed in Table 2.

Table 2. Reservoir Pool Data

| Level               | Elev.<br>(feet) | Capacity<br>(acre-feet) | Area<br>(acres) | Stream<br>flooded<br>(miles) | Shore<br>line<br>(miles) |
|---------------------|-----------------|-------------------------|-----------------|------------------------------|--------------------------|
| Top of dam          | 1,099           | -                       | -               | -                            | -                        |
| Maximum operating   | 1,080           | 3,650                   | 194             | 2.25                         | 4.1                      |
| Average annual min. | 1,063           | 1,000                   | 101             | 1.6                          | 2.8                      |
| Minimum             | 1,048           | 100                     | 20              | 0.5                          | 2.3                      |
| Stream bed          | 1,033           | -                       | -               | -                            | -                        |

12. Operation. - Park River Reservoir will be operated to modify extremes in natural flow conditions on the South Branch. Storage will be provided to reduce flood peaks and to augment the low-water flow for water supply and sewage dilution. Since flood discharges in the basin usually originate from spring snow-melt, the water level in the reservoir will be reduced from November 1 to March 1 to a maximum elevation of 1,074 feet. The storage thus depleted would be restored by spring run-off. If snow cover during the winter indicated a heavy spring run-off, the drawdown would be continued during March, and, if necessary, the water level would be reduced to elevation 1,048 feet. Low-water releases, after spring high-water levels had subsided, will be limited to downstream needs for water supply and sewage dilution. These needs will not exceed five second-feet, and the probable normal low-water flow will be between one and five second-feet below the dam.

During emergency periods, when spring run-off is insufficient to fill the reservoir, low-water releases will be reduced as warranted by the deficiency.

13. Water levels in the reservoir will not fluctuate sharply except during the spring run-off when, in most years, the reservoir will fill rapidly. High river stages from spring and early summer rains are infrequent. According to the plan of operation, the maximum operating pool will be held fairly constant during the late spring and summer months. Reservoir operation studies for the period from 1936 to 1945, inclusive, indicate that the maximum operating level of 1,080 feet can be maintained 25 percent of the time. The average annual minimum pool elevation of 1,063 feet will be equalled or exceeded for about 85 percent of the time. Extreme drawdown to or near the minimum pool will be of short duration and will occur about March 1 in those years when anticipated run-off will fill the reservoir.

14. Timber clearing. The sponsor plans to clear timber and brush on 240 acres within the reservoir site. All timber and brush below elevation 1,085 feet, five feet above the maximum operating pool, will be removed.

15. Pollution. No pollution now exists on the South Branch within the project site. The channel below Park River, however, and the main channel below Grafton are affected by sewage wastes. Municipal sewage wastes at Park River receive only primary treatment before being discharged into the stream. Grafton provides both primary and secondary treatment. Improved low-water flows will reduce pollution in these downstream reaches, but sewage at Park River should be given secondary treatment to assure the complete oxidation of pollutants.

16. Sedimentation. Soil erosion is not a serious problem in

the Park River Basin, and little silt is carried by the stream. The 100 acre-foot minimum pool is considered more than adequate to provide silt storage over the life of the project.

## FISHERY

### Present Fishery

17. The Park River supports a small sport fishery for bullhead, perch, sucker, and pike. Most of the fishing is done during the period of spring high water when fish are moving upstream from the Red River. Pike and suckers constitute the bulk of the catch during this period. During the rest of the year, the small size of the stream limits its carrying capacity, and most of the fishing is done by children seeking perch and bullheads in the pools.

18. Five low-head dams in the channel between the project area and the Red River appear to form impassable barriers to fish during periods of normal flow. However, during flood flows, these dams are often submerged, and the more active fish species are able to move upstream. Apparently, much of the fishery in the project area is furnished by these fish.

19. Records of the Service hatchery at Valley City, North Dakota, disclose that 3,000 bullheads, 7,000 bluegills, 3,500 crappies, and 1,000 largemouth bass were planted in the Park River from 1939 to 1947. Planting within the project area is not specified. In addition, other unrecorded plantings of fish may have been made. The small size of the stream and a lack of large pools have, apparently, prevented the establishment of bluegill and crappies.

20. An analysis of water from the project section of the stream reveals that the Park River, similar to other streams in this part of

North Dakota, is high in carbonates and quite high in sulphates. The water is not, however, alkaline enough to show any limiting effect on fish production. The chloride concentrations are normal for waters in this region, where leaching of these inorganic compounds occurs. The water is rich in phosphorous, having a concentration comparable to that of the best fish-producing waters in Minnesota. However, the concentrations of nitrogenous compounds are low.

21. The fishery value of the 2.25 miles of stream within the maximum operating pool is adjudged at \$20 per mile, or a total annual value of \$45.

22. The 62.1 miles of the river between the project area and the Red River will be influenced by the project through regulated flows. Although average flows throughout this reach are greater than in the project area, the habitat for fish is rendered somewhat less favorable by the entry of sewage from the communities of Park River and Grafton. A fishery value of \$25 per mile is assigned to this reach, for a total value of \$1,550.

23. A total preproject fishery value of \$1,600 is estimated.

#### Future Fishery

24. The proposed reservoir will, for all practical purposes, eliminate the stream fishery on the 2.25 miles of channel within the maximum operating pool. High operating levels will be maintained usually until midsummer, and drawdown to the minimum pool will not be approached until midwinter or late winter in most years.

25. There will be substituted for the stream fishery a lake-type fishery in the 194-acre maximum operating pool. This pool will be drawn down during the late summer, fall, and winter months to supply a regulated flow for sewage dilution and water supply in downstream

reaches. The most severe drawdown will take place in late winter during those years when heavy spring run-off is anticipated.

26. Stable late spring and early summer water levels will be beneficial to the spawning of nest-building fishes, such as bass and panfish. Shoal areas suitable for spawning will be restricted by the steep valley slopes. However, it is felt that sufficient spawning areas will be found in the upper reaches of the reservoir and in the tributary draws to maintain a fair fish population.

27. The fish inhabiting the reservoir will probably constitute a mixed population resulting from the reproduction of those species now present in the stream; namely, bullheads, yellow perch, suckers, pike, and forage minnows. This population will be supplemented by those species planted, most likely largemouth bass, bluegills, and crappies, all of which are usually available from Valley City hatchery.

28. The low concentration of nitrogen compounds has been mentioned in paragraph 20. Since nitrogen must be present to allow utilization of phosphorus by aquatic organisms, it is likely that the fish production of these waters, per unit of area, will not be high. The initial flooding will cover organic soils containing considerable amounts of nitrogen. Consequently, the production for the first few years will probably be good. As the reservoir ages, it is likely that production will drop, since, for the most part, production will have to depend on nitrogen brought in by the river waters. It might be pointed out that the ratio of phosphorus to nitrogen in plankton is about one to seven; in the Park River it is about one to three. This condition indicates that although the phosphorus content is high, a considerable portion of this phosphorus probably cannot be utilized in plankton production.

29. Winter drawdowns to a minimum pool of 20 acres are contemplated by the sponsor. A drawdown to a water area of this size will leave a conservation pool representing only a little more than 10 percent of the area of the maximum operating pool. Such a reduction in water area will crowd the fish population of the larger pool into a small area and possibly foster the spread of disease during the critical late winter period.

30. A heavy fishing pressure is expected to develop on this reservoir, in view of the fact that there are no natural lakes to distribute angling effort. This heavy fishing pressure should bring about good utilization of the fish crop.

31. In view of the above consideration, an annual fishery value of \$2,300 is assigned to the 101-acre average annual minimum pool.

32. Stabilized stream flow in the 62.1 mile reach of the river from the proposed damsite to the Red River should result in some benefit to the fishery. These benefits will accrue through the better dilution of sewage effluent and the elimination of periods of virtually no flow. An increase of 20 percent in the per mile value of this reach appears justified, resulting in a postproject value of \$30 per mile, and a total value of \$1,860 for the 62.1-mile downstream reach.

33. A future fishery value at \$4,160 is assigned, resulting in an annual gain of \$2,565. Fishery values are summarized in Table 3.

Summary of Fishery Value

Table 3. - Summary of Present and Future Values

|                           | <u>Preproject</u> | <u>Postproject</u> | <u>Net</u> |
|---------------------------|-------------------|--------------------|------------|
| Streams in reservoir area | \$ 45             | \$ 0               | -\$ 45     |
| Reservoir                 | -                 | 2,300              | 2,300      |
| Downstream                | <u>1,550</u>      | <u>1,860</u>       | <u>310</u> |
| TOTAL                     | \$1,595           | \$4,160            | \$2,565    |

## WILDLIFE

### Present Wildlife Resources

34. The Park River valley at the reservoir site has been a sheltered and favorable wildlife habitat in the midst of the open Red River plain. It appears that livestock grazing is the chief factor now operating to make it less than an ideal wildlife habitat. The project area was a State Refuge until 1945. It is now open to hunting.

35. Big game is represented by one species, the white-tailed deer. The irruptive increase of deer common in the Dakotas during the past decade has apparently occurred here. In 1945 the hunting season was opened on deer after having been closed for several years. In September 1946, State workers reported a herd of nine deer in the project area. A winter aerial count made in January and February 1947 showed 302 deer in the entire Park River valley. The area is heavily grazed and browsed and it is difficult to distinguish between the browsing by livestock and deer, since browsing and breakage by livestock masks the effect of deer browsing on trees and shrubs. It seems clear that competition exists between deer and livestock here. A kill of one deer each odd year would probably represent the maximum harvest. On this basis, the annual big game value would be \$50.

36. The upland game species are cottontail rabbit, pheasant and hungarian partridge. Red squirrel are common in the wooded area. Formerly there were snowshoe hares present. When sharptailed grouse were abundant in this portion of North Dakota the timber and timber edge was used by the grouse for budding, winter cover and summer shade. There are no jack rabbits, or only an occasional one, in the project area. This species is mainly limited to the prairie instead of the

wooded valley. Populations of pheasants and hungarian partridges are low. With both species suffering from a state-wide and region-wide decline, this low population is not surprising. However, even when populations of these species were high, this portion of Walsh County was considered poor pheasant and hungarian partridge range. Cottontail rabbits are not considered game animals in North Dakota at present, although it is conceivable with the dearth of game birds, coupled with increased hunting pressure, that they might assume some importance in the future. The present annual upland game value of the reservoir area is estimated at \$60.

37. Fur-animal species present in the area are beaver, weasel, mink, muskrat, raccoon, and skunk. Red foxes and coyotes are present but inhabit the prairie and seldom use the project area. Beaver have been increasing on many North Dakota streams and Park River is no exception. In 1945 there were three beaver live-trapped on Park River. There is no comparable record of the trapper's take for pelting purposes. However, in 1945 there were 151 beaver taken legally from Walsh County and in 1944 the number was 119. Within the project area muskrats, weasels, minks and raccoons are also trapped. Skunks are not trapped at the present time. Based on local information on the catch and using the North Dakota average pelt price for the past seven years, the present annual fur value is estimated at \$105.

38. Waterfowl usage of the Park River is slight. It is a resting area during migration. Small numbers of mallards and pintails have been shot there by hunters, particularly during stormy weather in the fall. It is the sort of habitat where one would expect to find wood ducks nesting, but no definite information was obtained on this species. Present annual waterfowl value is negligible and is estimated at \$5.

39. Present annual value for all wildlife species for the Park River Reservoir area is estimated to be \$220.

Future Wildlife Resources

40. The construction and operation of the reservoir will have a decided effect upon the wildlife and wildlife habitat. The initial effect will be the timber clearing operations, followed by the impoundment of water. As a result, some wildlife habitat will be destroyed and some waterfowl habitat will be created.

41. This piece of deer range will be destroyed by the timber clearing and the impoundment. The sponsor plans to clear timber and brush on 240 acres up to elevation 1,085 feet. Ordinarily for such a small area no loss would be assigned. In this case, however, it is doubtful if this portion of the deer herd can move upstream or downstream and be supported on a permanent basis because of competition with livestock and the severe winter weather in some years in this area. The future big game value for the reservoir area will be zero.

42. As a result of timber clearing and flooding the upland game habitat will be lost. Future value for these species will be zero.

43. The construction and operation of the reservoir will result in a marked change and some loss in the fur-animal habitat; 194 acres and 2.25 miles of stream will be flooded and replaced by 4.1 miles of reservoir shoreline. As a result terrestrial fur-animal habitat will be destroyed. Aquatic fur animals species beaver, muskrat and mink will suffer the following adverse effects: a winter drawdown between November and March; timber clearing to an elevation five feet above pool level, this limiting the amount of beaver food; and a rapid spring rise in water levels as the reservoir fills, with resultant danger to young beavers and muskrats. It is expected that these

factors will make the reservoir largely uninhabitable for beavers and probably muskrats as well. It is recognized that muskrat habitat may be improved for several miles below the dam due to increased flow and pollution abatement; since no field data was secured on this factor, however, it is not included in the present evaluation. Future annual fur-animal value is estimated at \$30.

44. It is expected that creation of the reservoir will increase waterfowl usage. This will be true during migration. It is doubtful that nesting will become important due to several factors, among these over grazing and steep banks, are the most adverse. Waterfowl food plants will probably be limited. Two old beaver meadows near the upper end of the reservoir offer the best possibility for establishing emergent or moist soil plants. In predicting future waterfowl use a study was made of the waterfowl records for Billings Lake Easement Refuge, about 50 miles northwest of the Park River project. There is little doubt that the Park River reservoir, in normal years, will be less favorable waterfowl habitat than Billings Lake. Based on estimated usage amounting to 8,000 duck days and 400 goose days, the annual value would be about \$22. In drouth years, however, the water in the Park River Reservoir will have a premium value for all uses, including waterfowl, because most of the natural sloughs and potholes in North Dakota will be dry. Under such drouth conditions in a dry year, waterfowl usage of 100,000 duck days would be a conservative estimate. If such conditions occurred on the average once in three years, the annual value would be \$83. Considering both normal and drouth periods the total future annual waterfowl value is estimated then at \$105.

Recapitulation of Wildlife Values

45. Present wildlife values and the annual values after the project is constructed, are summarized in Table 4.

Table 4. - Summary of Wildlife Value

|             | <u>Preproject</u> | <u>Postproject</u> | <u>Net</u>   |
|-------------|-------------------|--------------------|--------------|
| Big game    | \$ 50             | \$ 0               | -\$ 50       |
| Upland game | 60                | 0                  | - 60         |
| Fur animals | 105               | 30                 | - 75         |
| Waterfowl   | <u>5</u>          | <u>105</u>         | <u>+ 100</u> |
|             | \$ 220            | \$ 135             | -\$ 85       |

MEANS FOR MITIGATING LOSSES AND DERIVING MAXIMUM BENEFITS

46. The project, as proposed by the sponsor shows a net gain of \$2,565 to the fishery resource. This gain could be increased by \$700 annually to a total of \$3,265 if certain changes in operation are incorporated in the plan. The principal adverse factor involved in the fishery is the small size of the minimum pool, representing approximately 10 percent of the maximum operating pool. Crowding of the fish population into this small area during the period of late winter oxygen shortage, may result in loss of a portion of the fish population. The maintenance of a minimum pool of approximately 50 acres at elevation 1,053 feet, in place of the 20 acre pool at elevation 1,048 feet, would result in considerable benefit to the fishery.

47. Because the present fishery in South Branch appears to be largely dependent on the spring run, some consideration was given to the question of fishways. There are, however, no true migratory fish present and all conditions for the life cycle of the existing species can be met in the reach below the dam. Above the dam, fishery will be changed to a lake type. Also, fishways in similar situations have proved to be inefficient and pass more rough fish than game fish.

For these reasons a fishway over the Park River dam is not considered feasible.

48. There is not much that can be done to mitigate the wildlife losses. This is not serious because of the minor values involved. It appears, however, that the proposal to clear timber to elevation 1,085 feet should be modified. Judging from studies in similar situations a two-foot freeboard would be sufficient to prevent timber killing by inundation. Only the area below elevation 1,082 feet, then, should be cleared. This would save 25 to 30 acres of timber as game cover, beaver food, and den sites for fur animals. The annual monetary value to wildlife, however, would be low, probably about \$10.

49. The wildlife habitat could be improved by eliminating or drastically reducing the livestock grazing. Some good winter cover should develop if the area is relieved from grazing pressure. In addition, protection of the shoreline would be valuable to waterfowl and the fishery. The acreage involved within the taking line is rather small, 46 acres, but the shoreline of more than 4 miles is important. Even though it may not be practicable to fence the entire area, selected areas should be fenced for wildlife purposes. The increase in annual value is difficult to estimate, but if half the shoreline is protected it might amount to an annual increase in value of \$140.

#### Summary of Values

50. Present and future annual fish and wildlife values for the Park River Reservoir, as proposed by the St. Paul District Engineer, are summarized in Table 5. If the project is modified in accordance with the proposals just described, the values will approximate those listed in Table 6.

Table 5. - Annual Fish and Wildlife Value

Under the Sponsors Plan

|               | <u>Present</u> | <u>Future</u> | <u>Net</u>  |
|---------------|----------------|---------------|-------------|
| Fish          | \$1,595        | \$4,160       | +\$2,565    |
| Wildlife      | <u>220</u>     | <u>135</u>    | <u>- 85</u> |
| Total         | \$1,815        | \$4,295       | \$2,480     |
| Total rounded | \$1,820        | \$4,300       | \$2,480     |

Table 6. - Annual Fish and Wildlife Value

Under Modified Plan

|          | <u>Present</u> | <u>Future</u> | <u>Net</u>  |
|----------|----------------|---------------|-------------|
| Fish     | \$1,595        | \$4,860       | +\$3,365    |
| Wildlife | <u>220</u>     | <u>185</u>    | <u>- 35</u> |
| Total    | \$1,815        | \$5,045       | +\$3,330    |

Net gain of Modified Plan over Sponsor's Plan, \$725.

Conclusions and Recommendations

51. This report is based on the Sponsor's Definite project report dated May 1, 1947. If there is any deviation or change from the plan, the Fish and Wildlife Service should be advised so that fish and wildlife values can be modified if necessary.

52. If the project is built and operated, as proposed by the St. Paul District Engineer, the net effect will be beneficial to fish and wildlife resources. The net annual gain is estimated to be \$2,480. If certain modifications are made in the project as outlined in the recommendations, additional values will be created. Adoption of number 1 will increase the value annually by \$700, and numbers 5 and 6 by \$150.

53. It is recommended that:

1. A 50-acre fish and wildlife pool be substituted for the

proposed 20-acre minimum pool, in other words, water levels not to be drawn below elevation 1,053 feet.

2. Water level fluctuations be held to a minimum of 18 inches in any two-week period between May 15 and June 30.

3. No fishway be constructed in the dam.

4. Municipalities discharging sewage wastes into the Park River be required to treat those wastes to at least a minimum standard.

5. Timber and brush in the proposed reservoir be cleared up to elevation 1,082 feet but not above that level.

6. Certain of the lands owned by the United States in this project be fenced to exclude livestock.

7. The entire project area be opened to free use by the public except such portions as may be reserved by the sponsoring agency for the purpose of safety, efficient operation or protection of public property.

8. Management and regulation of the fish and wildlife resources of the project be vested in the North Dakota Game and Fish Department.

(SGD) RUDOLPH DIEFFENBACH  
Coordinator, River Basin Studies

APPENDIX B

Mr. W. G. Tollack  
Mayor, Grafton City

This is to certify that the Board of Health of  
Walsh County approves of bathing facilities  
being incorporated in the Homme Dam Project,  
and that it will in no way violate any of the  
Board of Health laws.

C. J. Glaspel, M.D.  
Superintendent, Walsh Co. Board of Health

Grafton, No. Dak.  
June 25, 1948

MASTER RECREATION PLAN  
MOMME RESERVOIR AND DAM, NORTH DAKOTA  
ST. PAUL, MINNESOTA DISTRICT CORPS OF ENGINEERS



Photograph No. 1 - Looking west from Grand View Point. Speed boat races sponsored by the Walsh County American Legion Association.



Photograph No. 2 - View at Walsh Memorial Beach showing need for establishing of parking areas.

MASTER RECREATION PLAN  
HOMME RESERVOIR AND DAM, NORTH DAKOTA  
ST. PAUL, MINNESOTA DISTRICT CORPS OF ENGINEERS



Photograph No. 3 - A Sunday band concert at Walsh Memorial Beach.



Photograph No. 4 - Crowds at Walsh Memorial Beach Watching water-sports activities.

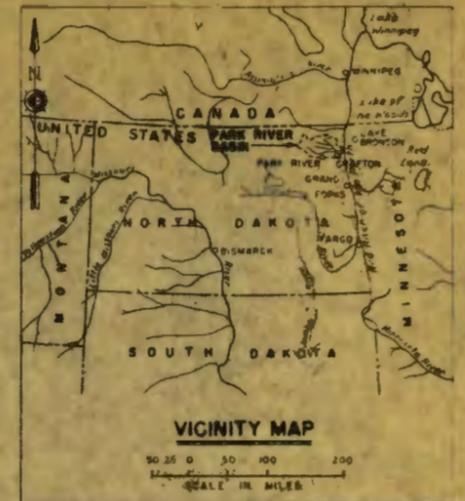
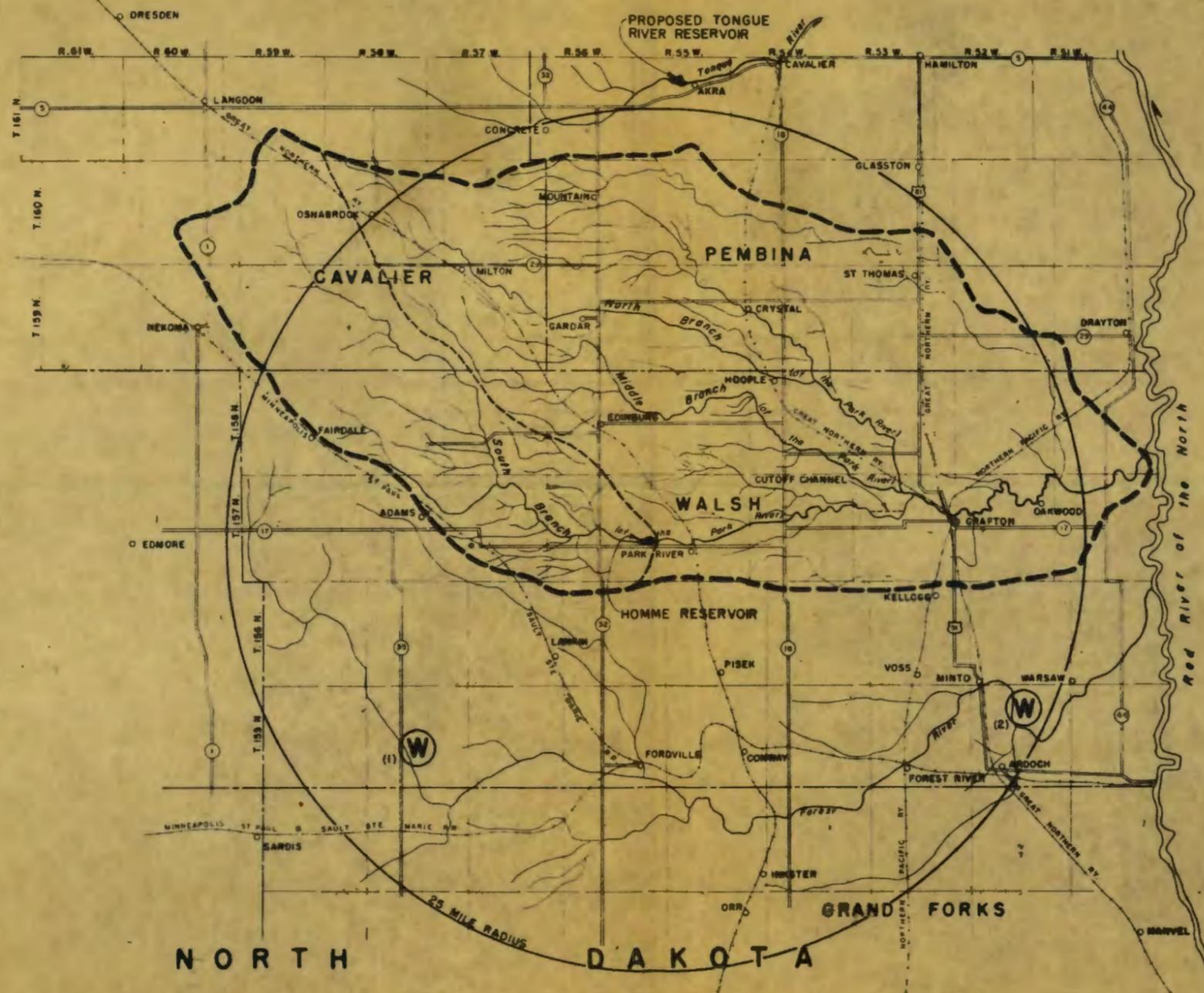
MASTER RECREATION PLAN  
HOMME RESERVOIR AND DAM, NORTH DAKOTA  
ST. PAUL, MINNESOTA DISTRICT, CORPS OF ENGINEERS



Photograph No. 5 - A family picnic at Walsh Memorial Beach



Photograph No. 6 - A view looking southwest from Walsh Memorial Beach toward upper end of Homme Reservoir.



MINNESOTA

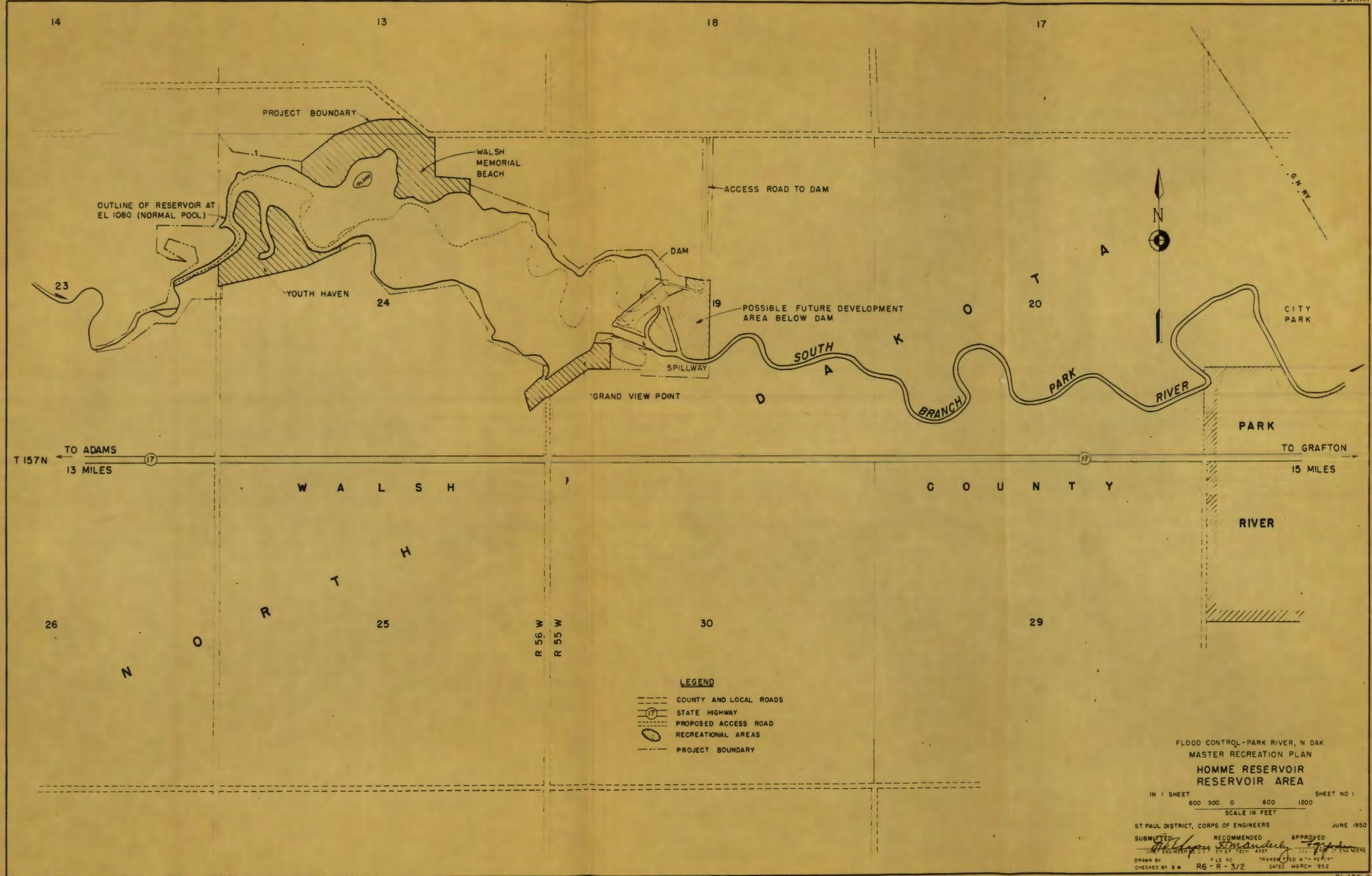
**LEGEND**

- RIVER BASIN BOUNDARY
- U. S. HIGHWAY
- STATE HIGHWAY
- U. S. FISH AND WILDLIFE SERVICE REFUGES
- (1) PIONEER LAKE NATIONAL WILDLIFE REFUGE
- (2) LAKE ARDOCH NATIONAL WILDLIFE REFUGE

NORTH DAKOTA

FLOOD CONTROL - PARK RIVER, N. DAK.  
 MASTER RECREATION PLAN  
 HOMME RESERVOIR  
 GENERAL MAP OF BASIN  
 IN 1 SHEET SHEET NO 1  
 SCALE IN MILES

ST. PAUL DISTRICT, CORPS OF ENGINEERS JUNE 1950  
 SUBMITTED: [Signature] RECOMMENDED: [Signature] APPROVED: [Signature]  
 DRAWN BY: [Signature] FILE NO. R6-N-3/1 TRANSMITTED WITH REPORT  
 CHECKED BY: [Signature] DATED MARCH 1952



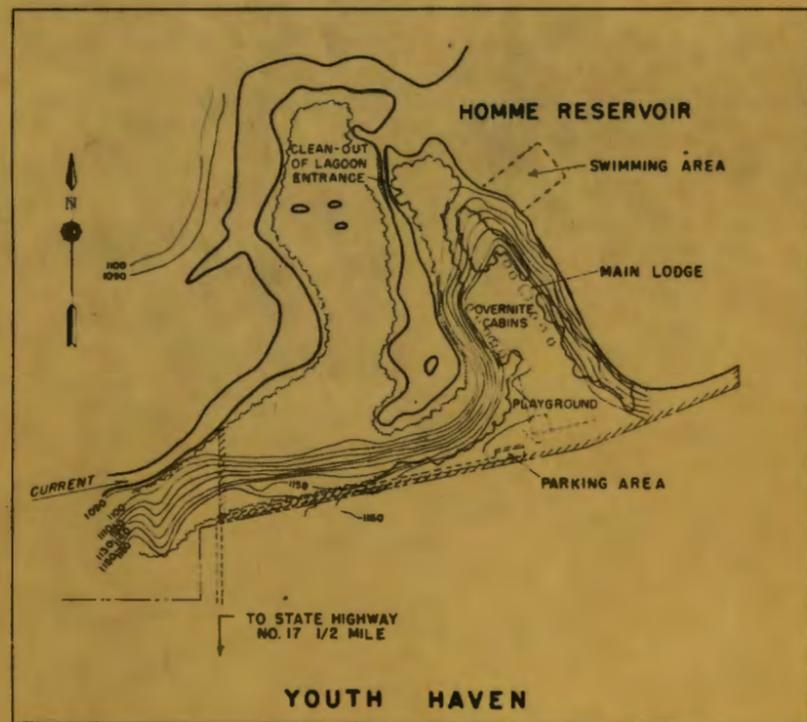
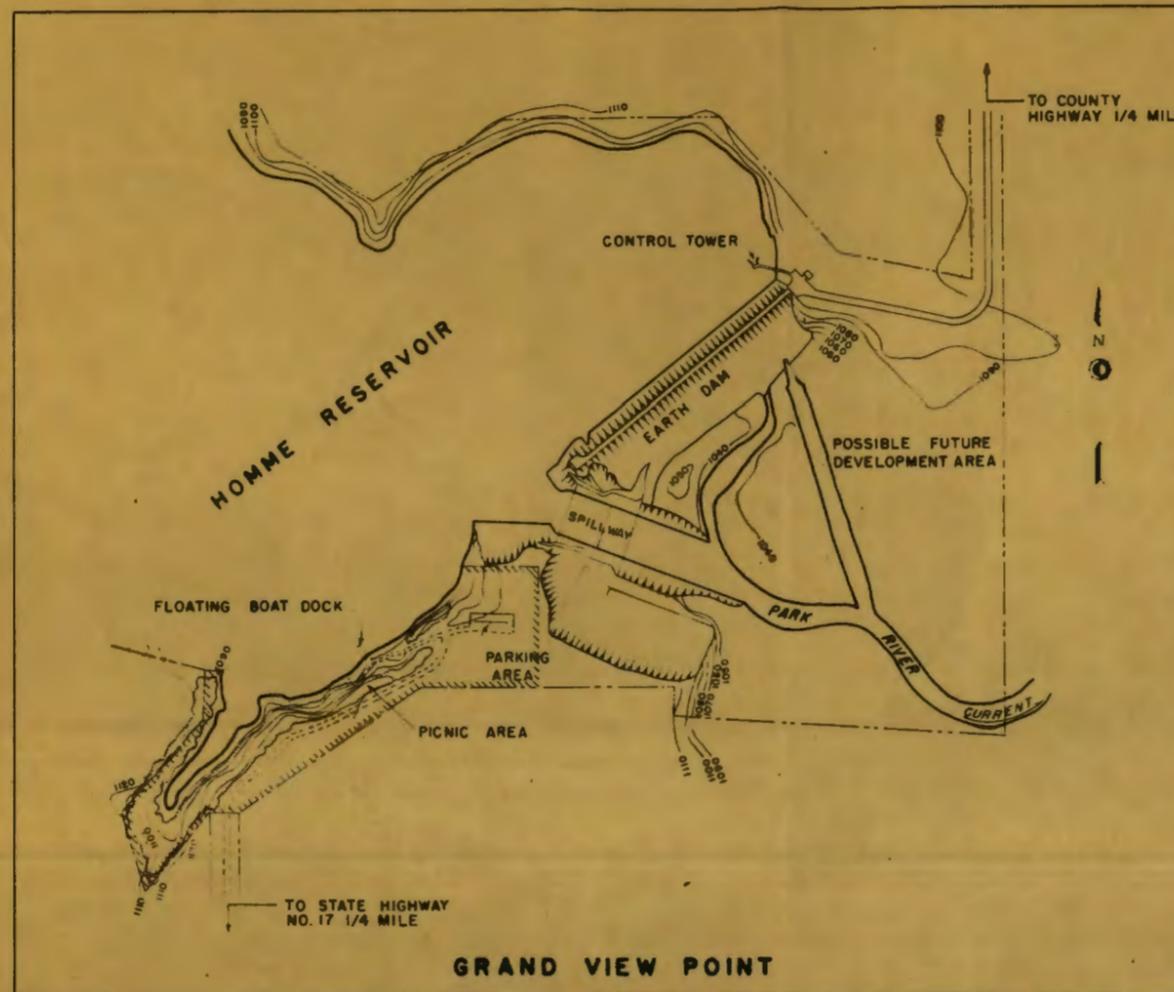
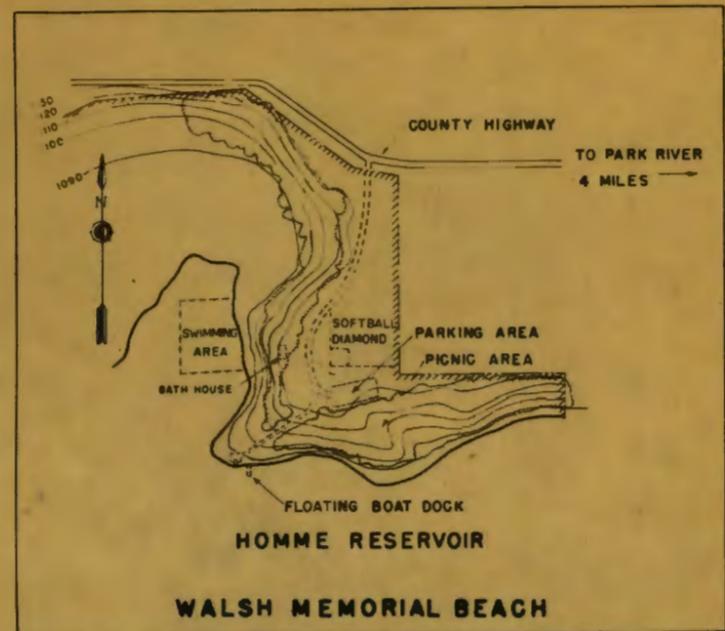
**LEGEND**

- COUNTY AND LOCAL ROADS
- (17) STATE HIGHWAY
- - - PROPOSED ACCESS ROAD
- RECREATIONAL AREAS
- - - PROJECT BOUNDARY

FLOOD CONTROL-PARK RIVER, N DAK  
 MASTER RECREATION PLAN  
 HOMME RESERVOIR  
 RESERVOIR AREA

IN 1 SHEET 600 300 0 600 1200 SHEET NO 1  
 SCALE IN FEET

ST PAUL DISTRICT, CORPS OF ENGINEERS JUNE 1950  
 SUBMITTED: [Signature] RECOMMENDED: [Signature] APPROVED: [Signature]  
 CHIEF ENGINEER DISTRICT CHIEF TECH. ASST. DISTRICT ENGINEER  
 DRAWN BY: [Signature] FILE NO. TRANSMITTED BY: [Signature]  
 CHECKED BY: B W R6-R-3/2 DATED MARCH 1952



LEGEND

- PROJECT BOUNDARY
- NORMAL POOL, EL. 1080
- EXISTING ACCESS ROAD
- - - PROPOSED ACCESS ROAD
- ▭ TIMBERED AREA
- ▨ RECREATION AREA

FLOOD CONTROL - PARK RIVER, N. DAK  
 MASTER RECREATION PLAN  
 HOMME RESERVOIR  
 DEVELOPMENT AREAS

IN 1 SHEET SHEET NO. 1  
 300' 200' 100' 0' 300' 600'  
 SCALE: 1 INCH = 300 FEET

ST. PAUL DISTRICT, CORPS OF ENGINEERS JUNE 1950

SUBMITTED: RECOMMENDED: APPROVED:  
*[Signatures]*  
 CHIEF ENGINEER DIV. CHIEF TECH. ASST. COL. CORPS OF ENGINEERS

DRAWN BY: FILE NO. TRANSMITTED WITH REPORT  
 CHECKED BY: BW R6-R-3/3 DATED MARCH 1952

MASTER RECREATION PLAN, HOMME RESERVOIR, PARK RIVER, NORTH DAKOTA