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## Iowa's Artificial Lakes

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*Iowa Fish and Game Commission*

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## IOWA'S ARTIFICIAL LAKES

W. W. AITKEN, *State Biologist*

In the Iowa 25-Year Conservation program a series of artificial lakes were planned for Southern Iowa.

On August 26, 1932, the Betz Construction Company of Sioux City, was awarded the contract by the Iowa Fish and Game to build the dam for the first lake under the supervision of the Brown Engineering Company of Ottumwa. All other dams have been built by the State Board of Conservation and the Fish and Game Commission, with the aid of Federal agencies.

This first created lake with its surrounding state owned land is described because the construction of the dam, the water-shed problems, the depths in relation to surface area, the lake bed improvements, the aquatic vegetation plantings, the fish stocking program, and the general lake and park developments are typical of the other areas.



Lake Wapello

A site on the Pee Dee Creek, a tributary of Soap Creek, which in turn flows into the Des Moines river was chosen for the first lake. The area lies partly in Marion and partly in Fox River Townships of Davis County. The site was selected and approved by the late Professor Floyd A. Nagler of the State University of Iowa, Hydraulic Laboratories, because it more closely conformed to the

requirements of engineering principles than many other proposed sites inspected by the Commission. Important factors considered were: character of stream impounded, such as gradient, amount of silt in suspension and stream volume; feasibility of dam construction; acreage and topography of watershed; extent of agriculture in drainage area; cost of land; area and depth of lake in direct relation to dam cost and land cost; contours of lake bed; amount of local participation; and location in respect to proximity of other public areas.

Work on the dam began Sept. 9, 1932, and construction was finished July 1, 1933. (See fig. 1.) The dam is an earth fill of

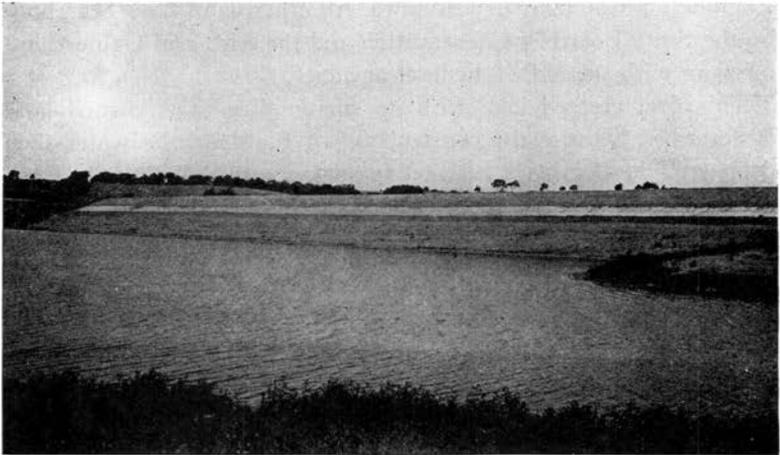


Fig. 1. Lake filling

Kansas drift, having a top line of 1,100 feet. The width at base is 246 feet, the top width is 20 feet. The height of the dam is 47 feet with the spillway crest at the 35 foot mark. The lake side has a 3 to 1 slope, and a concrete slab 15 feet wide is laid the length of the fill to prevent erosion at crest level. The back slope of the dam has a  $2\frac{1}{2}$  to 1 slope up to the 22-foot height. Here a 12-foot berm notches the fill. The remaining 25 feet has a 2 to 1 slope.

The surface area of the water impounded approximates 352 acres, and the basin capacity is 4,000 acre feet. The water depth on the valley floor in front of the dam is 35 feet. The shoreline measures 12 miles and the outline from above resembles a dragon.

The State purchased for this park 983 acres at an average cost of \$26.00 per acre. At the entrance of the park  $12\frac{1}{2}$  acres of land were deeded as a gift to the State by Mr. and Mrs. Douglas Lowe,

of Drakesville. Nine thousand dollars was donated by local subscription to help defray the cost of the project. The lake lies in the center of the park area which places entire shoreline under State jurisdiction. The lake is primarily designed for a fishing lake. Impounding of water began April 12, 1933. The name was chosen because this area was once the hunting ground of Chief Wapello and in addition to its local significance, the name is easy to spell and pronounce.

The slopes above the water-line on the east, south and west sides are rather rugged drifts covered with white, burr, black, red, and laurel oak; shell-bark and pig-nut hickory; and American and red elm. Nearer the water courses, are soft maple, box-elder, willow, cottonwood, river birch, honey locust, and black walnut. A few scattered hackberry are found on the western slopes. The most abundant oaks were *Quercus imbricaria*, *macrocarpa*, and *alba*. The north slopes were in fields of corn, cane, soy-beans, red-clover, and timothy hay.

The impounded area was in blue-grass pasture, corn, and clover and timothy fields; some portions were wooded. The fauna was typical for this region.

The creek impounded ran over gravel beds of Kansas and Nebraskan origin and had a fairly constant flow. An analysis of the water by Professor Jack Hinman, Director of the State Hygiene Laboratories at Iowa City, showed considerable amounts of iron bacteria.

The creek contained species of the brown and black bull-head (*Ameiurus nebulosus* and *melas*), the green sunfish (*Apomotis cyanellus*), the horned dace or creek chub (*Semotilus a. atromaculatus*), the black-head or fat-head minnow (*Pimephales promelas*), and the back-striped shiner (*Notropis dorsalis dorsalis*).

Because the black bullhead was so abundant, and for fear other undesirable species might be present, the creek was treated with hydrated chloride of lime to eliminate these species. A screen was placed at the discharge end of the dam flume to prevent further contamination of the area by obnoxious species while work was in progress.

Stocking the new lake began April, 1933, with 227 adult large-mouthed bass. It was thought that should any of the native fish survive the chloride treatment these large carnivores would eliminate them before the creek overflowed its natural banks. The total stocking to date includes the following numbers and species: large mouthed bass, 26,500; crappies, 21,000; bluegill, 105,000; yellow

bullheads, 6,100; forage fish, 50,000 blackhead minnows and 14,000 golden shiners. The total stocking program calls for 150,000 adult species on opening day. This plan is intended to populate the lake so that the public can fish in 1936, providing other factors do not arise beforehand to prevent a public opening at that time.

One thousand two hundred lake bed improvement devices were installed to keep this lake at peak production. (See figs. 2, 3, 4, and 5.) These structures consisted of 244 log and brush shelters of various types worked out by J. C. Salyer, at present with the U. S. Biological Survey, and the author. In addition to the brush

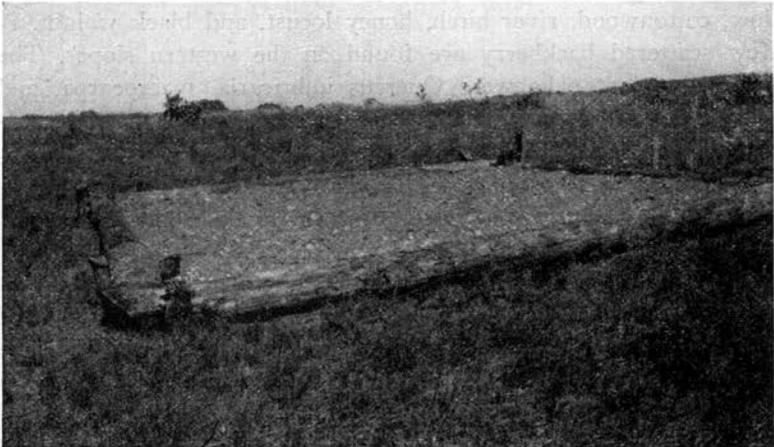


Fig. 2. Gravel spawning bed



Fig. 3. Star type rock shelter



Fig. 4. Water approaching shelters



Fig. 5. Log and brush shelter

shelters, 940 rock, gravel, and tile structures were built for fish shelter, and spawning purposes.

Aquatic vegetation of emergent, submerged, and floating types are to be introduced to accelerate the change from a terrestrial to an aquatic environment. Species include *Myriophyllum*, *Ceratophyllum*, *Chara*, *Sagittaria latifolia*, *Typha latifolia*, *Scirpus validus*, and *fluviatilis*, *Iris versicolor*, *Potamogeton natans* and perhaps other broad-leaved Sage pond-weeds. The narrowed-leaved Sage pond weeds (*P. pectinatus*) will not be used because of its extreme fecundity in southern Iowa waters.

The entire drainage area was put under erosion control, and  
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above the backwater of the lake across each of the three larger streams feeding the lake, large silt basins were constructed to minimize siltation. (See figs. 6 and 7.) All labor on the park has



Fig. 6. Silt dam spillway

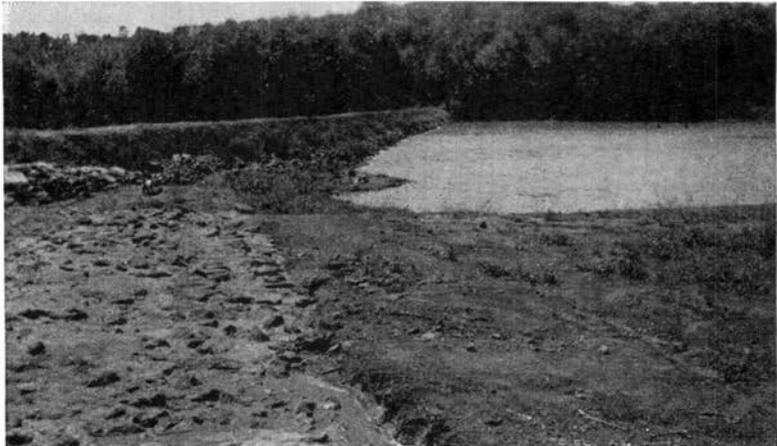


Fig. 7. Silt dam and 5 acre basin

been done by volunteers, and government relief agencies. Volunteer and R. F. C. labor preceded the establishment of a CCC camp on May 31, 1933, under Forest Service supervision. On Nov. 18, 1933, the status was changed to Park Service under Department of Interior jurisdiction.

In connection with the lake development a series of nursery ponds were built to propagate large-mouth bass, bluegills, crap-

pies, and forage minnows. The ponds are located below the dam where water can be gravitated without pumping costs. (See figs. 8 and 9.) The production capacity will be sufficient to supply this

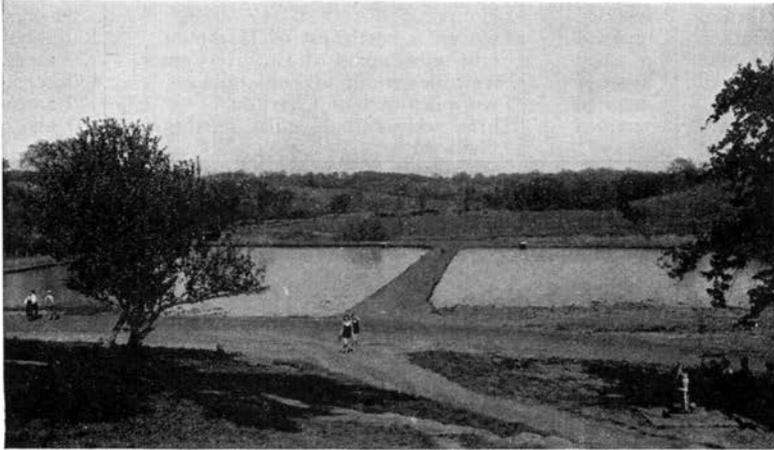


Fig. 8. Bass rearing ponds

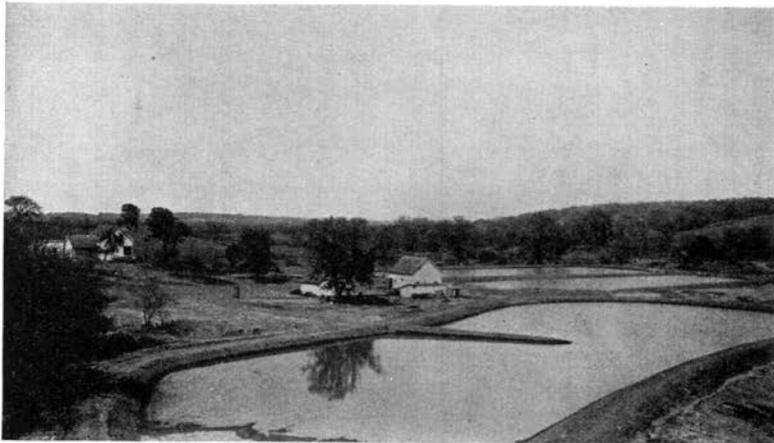


Fig. 9. 58,000 bass, crappie, and bluegills were produced in these ponds the season of 1934 lake and another nearby area. It is planned to have enough pond space in connection with the artificial lake development to more than supply each new lake with game fish.

Some of these lakes are completed and are filling with water. The others are in process of construction. All of Iowa's artificial lakes will have fisheries improvements installed in their beds, aquatic vegetation introduced, and systematic stocking correlated with biological conditions.

*Other Artificial Lakes*

COUNTY	NAME	LOCATION	AREA
Mahaska	Lake Keomah	Five miles east of Oskaloosa	90 acres
Johnson	Unnamed	Four miles west of Solon	180 acres
Delaware	Unnamed	One and one-half miles north of Dundee	125 acres
Hardin	Unnamed	Eldora	70 acres
Franklin	Unnamed	Two miles northwest of Hampton	130 acres
Guthrie	Unnamed	Eight miles north of Guthrie Center	30 acres
Warren	Unnamed	Five miles south of Indianola	130 acres
Lucas	Unnamed	Two miles east of Chariton	70 acres
Taylor	Unnamed	Three and one-half miles northeast of Bedford	100 acres

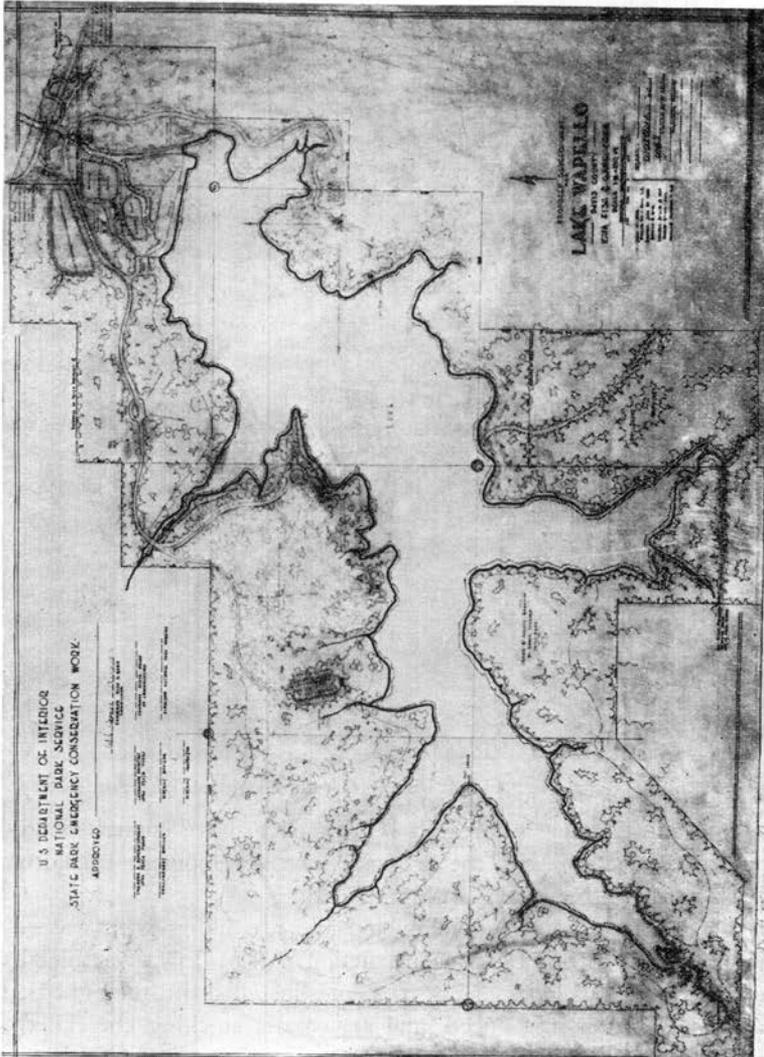


Fig. 10. Showing area of proposed development for Lake Wapello, Davis Co., Iowa

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