

Nebraska's New Reservoir Construction Program

Need

Most sport fishing in Nebraska occurs on man-made reservoirs. In the past, reservoirs were constructed without input from the Nebraska Game and Parks Commission (NGPC) by other entities concerned primarily with irrigation and flood control. The needs of fish, anglers, and boaters got little consideration; most basins were cleared of all trees and made smooth and featureless, and the NGPC was not involved until the reservoir was filled with water and fish stockings were requested.

In 1972, the Nebraska Legislature created Natural Resource Districts (NRDs) to address problems related to flooding, soil erosion, irrigation runoff, and groundwater quantity and quality. There are 23 NRDs across the state, funded primarily with property taxes, with boundaries based on river basins.

NRD flood-control projects typically include construction of many small impoundments in the watershed, along with one larger reservoir available for public recreation. By developing third-party pass through agreements with NRDs and reimbursing them with Sport Fish Restoration funds to incorporate fish, angler, and boater-friendly features, flood-control reservoirs in eastern Nebraska are now being built to produce and sustain quality sport fish populations and provide convenient access to anglers and boaters.

Objectives

This program incorporates and funds development of in-lake features that benefit fish, anglers, and boaters in new reservoirs open to public recreation.

Procedures

NGPC involvement begins with pre-construction design planning (usually 3-5 years before construction) and does not end until water is impounded. We have one employee in Fisheries Division (Steve Satra) who has the responsibility of developing reservoir construction concept plans with NRDs, helping them select engineering consultants and construction contractors, monitoring the activities of consultants and contractors, and providing advice and oversight throughout the reservoir-construction process.

Most eastern-Nebraska reservoirs are built in what was a corn field, with highly erodible soils and steep topography, and a perennial stream. To cope with these conditions, features incorporated into new reservoirs have included the following:

- **Sediment/nutrient dikes** in the upper ends of reservoirs to intercept high inflows from the watershed, maintaining water clarity and limiting phosphorous and other products of agricultural runoff.
- **Perpendicular breakwaters** to reduce the impacts of wind and waves on erosion-prone shorelines not protected by natural features and to provide calm water for boating access facilities. These structures also provide habitat for aquatic organisms eaten by fish, fish spawning areas, and angler access to deep water.
- **Off-shore breakwaters** to reduce the impacts of wind and waves on erosion-prone shorelines not protected by natural features. These features allow unrestricted movement of fish and typically have a deepened swale between the breakwater and the shoreline which attracts fish on the downwind side of the breakwater.



- **Island armoring with rock riprap** to prevent erosion of naturally above-water areas within the basin. These spots can also be enlarged with material excavated from other areas.
- **Scallops** excavated along shallow shorelines to provide areas of deep water that will attract fish.
- **Shoals** to attract fish in deeper water with material excavated to create scallops. Rock, gravel and clean broken concrete can also be added throughout the basin in both deep and shallow water to attract fish. The entire basin is purposefully excavated to be as rough as possible to provide depth diversity.
- **Vegetation barriers** to provide open water for anglers adjacent to shallow, vegetated areas, creating an “edge” effect that attracts fish. A woven geotextile fabric and 4 inches of pea or road gravel not only inhibits development of aquatic vegetation but also serves as excellent spawning substrate for largemouth bass and bluegill.
- **Cove or bay deepening and enlargement** to enhance fish spawning and nursery habitat. These locations usually develop stands of submergent and emergent vegetation that provide food and cover for fish.
- **Trees maintained in the basin** to attenuate waves and to attract fish. Those trees that need to be removed for the dam embankment and to create boating lanes are incorporated into brushpiles anchored in the basin.
- **Vegetative plantings** to provide seed stock for aquatic and terrestrial plants not found in a corn field.
- **Handicap-accessible piers** to provide bank anglers access to deep water. Piers are often constructed in conjunction with perpendicular breakwaters.
- **Small hard points or nodes and shoreline grading** to improve bank angler access.
- **Handicap-accessible boat launching facilities**, including an access road, parking area, dock(s), concrete boat ramp lane(s), restroom, potable water, and site lighting are provided, often near an adjacent dog-leg perpendicular breakwater to provide wind and wave protection for boat launching.
- **Boating restricted to 5 mph, no wake** to further limit shoreline erosion and to produce quality fishing experiences not always associated with power boating.

Results

Since 1998, seven small reservoirs, ranging from 42 to 637 acres and totaling 1,813 acres have been constructed in eastern Nebraska, many near population centers, by Natural Resources Districts with NGPC involvement. Three more are currently under construction and another is being planned.

Benefits

All reservoirs constructed with NGPC involvement have sustained quality fish communities, consisting primarily of largemouth bass, bluegill, and channel catfish. Other species sometimes stocked into these new reservoirs include walleye, black crappie, redear sunfish, blue catfish, and northern pike.

Harvest restrictions (15 or even 21-inch minimum length limits on largemouth bass, with no more than one fish over 21 inches per day) are implemented to take advantage of good habitat and promote development of high-density largemouth bass populations. Predation on intermediate bluegill reduces intraspecific competition and typically sustains fish in excess of 8 inches, with Master Angler fish ≥ 10 inches not uncommon. These reservoirs also produce some of our state’s best largemouth bass fishing.

Evaluation

These new reservoirs have supported high fishing pressure and have produced high catch rates of quality-sized fish. At Lake Wanahoo, our newest reservoir (pictured), anglers spent over 100 hours per acre on this 637-acre impoundment from April through December, 2012 and caught nearly 1.5 fish per hour. Levels of use and angling success have not declined over time on these seven reservoirs, as was always the case with reservoirs built previously without in-lake features. Rather, good aquatic habitat has continued to sustain quality fishing!

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