

ASWM State Wetland Program

Integration Case Study: Nebraska

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Incorporating Wetlands into Reservoir Rehabilitation Projects for Fisheries and Other Benefits in Nebraska



State Wetland Program Information

This case study¹ explores the integration efforts undertaken by the Wildlife Division of Nebraska's Game and Parks Commission. Through partnerships with the Commission's Fisheries Division and other state agencies the Nebraska Aquatic Habitat Program was established in 1997. The program is run by three full-time staff members and has hundreds of thousands of wetlands within its purview. The program predominantly relies on partners and grants to fund projects throughout the state.

Type of Integration Effort

The Aquatic Habitat Program brings stakeholder agencies together to focus on projects that address sediment removal, recreation, fisheries and wildlife habitat, shoreline protection, wetland development, drainage improvements, and water quality.

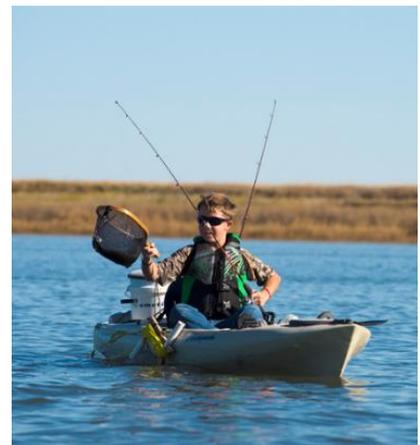
¹ Project Case Study Criteria: The Association of State Wetland Managers (ASWM) conducted interviews with representatives from state wetland programs actively integrating with one or more additional resource management programs operating within their state. Criteria for case study inclusion required eligible programs to demonstrate direct or indirect impacts of integration on watershed-level planning, implementation and/or outcomes documented using formal or informal performance measures. Further consideration was given to integrated programs with the ability to provide cost-benefit insights.

Scale of Integration Effort

The Aquatic Habitat Program is a statewide effort to “improve conditions for aquatic life through better management or rehabilitation of existing resources and [collaborate] with partners to build new waters to make them the best they can be. Funding for this program is provided by the purchasing of the Aquatic Habitat Stamp which is included in the price of [a] fishing license... The legislation establishing the [State’s] Aquatic Habitat Stamp required a written plan identifying which waters were impaired and the type of work needed to restore them to productive healthy habitats. Funding is restricted to only those waters listed on the Aquatic Habitat Plan.”² While most of the funded projects focus on the management and rehabilitation of Nebraska’s many reservoirs some projects include other aquatic resources such as trout streams and the Sandhill Lakes.

Integration Goals

Integration enables the Aquatic Habitat Program to strengthen the feasibility and outcomes of its projects by drawing upon expertise and funding across agencies to implement a holistic approach to managing the State’s aquatic resources. While the primary goal of the program is improved fish habitats and angler access, the understanding that water quality is an essential component for healthy fisheries is a fundamental tenet of this collaborative approach. Partnering with agencies whose expertise span the interdependent aspects of regional water quality has led to comprehensive project goals addressing healthy wetlands, in-lake structures, watershed best management practices (BMPs), and incorporation of lacustrine fringe and other vegetation. The plan prioritized twelve projects throughout the state that would benefit anglers and revitalize aquatic habitats. This included hiring contractors to reconfigure the footprint of reservoirs to cultivate deeper waters near the shoreline interspersed with shallow vegetated areas conducive to fish and other wildlife. Piers and rock jetties were also utilized to increase angler access to deeper water.



Integration Process Timeline

Predominantly constructed in the 1960s and 70s, many of Nebraska’s reservoirs had begun to deteriorate by the early 1990’s. “Basins had filled with silt, shorelines had eroded, water quality had degraded, and less-than-desirable fish communities made for poor angling.”³ At many locations shallow, muddy water made it impossible for anglers to bank fish from the shoreline.

²Aquatic Habitat Program. (2018, October 19). Retrieved from <http://outdoornebraska.gov/aquatichabitatprogram/>

³ Magazine, N. (2018, July 05). Aquatic Habitat Program Celebrates 20 Years. Retrieved from <http://magazine.outdoornebraska.gov/2018/06/aquatic-habitat-program/>

A committee was formed in 1993 to develop a revitalization plan for these important aquatic resources with the goal of improving fish habitats and increasing angler access. The committee was comprised of representatives from wildlife, wetlands and fishery agencies as well as the department of environmental quality of water. The committee held 19 public meetings across the state that first year, with more than 650 anglers attending to “discuss problems and possible solutions related to aging reservoirs and aquatic habitat.”⁴ The following year a three day conference was held convening seventy anglers along with biologists and other experts to “[identify] priorities and [develop] a course of action for addressing the state’s aquatic habitat issues.”⁵ Through these conversations the committee developed the framework for Nebraska’s innovative Aquatic Habitat Program and Aquatic Habitat Stamp.

The planning process continued for another three years as the committee identified solutions and best practices to both revitalize the state’s aging waters and address anglers’ concerns. New legislation was passed in 1996 implementing the Aquatic Habitat Stamp generating funds for the implementation of selected projects.

“More than 20 years later, sales of the stamp have generated more than \$22 million for improvements to 127 waterbodies across the state. Many additional funding partners, including the Nebraska Environmental Trust Fund, the Federal Sport Fish Restoration Fund, Natural Resources Districts and cities across the state, have contributed an additional \$73 million for Aquatic Habitat Program projects, which have improved water quality, removed sediment, stabilized shorelines, added submerged aquatic habitat structures, provided for the construction of fishing docks and piers and much more.”⁶

Addressing the Issue of “Aging Waters”

When first constructed reservoirs receive a tremendous biological pulse lasting fifteen to twenty years. After this initial period, they begin to fill with sediment and are considered “aging waters”. The deterioration of water quality is often amplified by a lack of vegetation along the reservoir shoreline leading to erosion and additional sediment deposits. These compounding issues often lead to shallow muddy waters and a loss of healthy habitats for fish and other wildlife, which in turn results in reduced opportunities for anglers and other aquatic recreation.

Project Leadership

The Fisheries Division of the Nebraska Game and Parks Commission leads the Aquatic Habitat Program with partnerships varying according to the scope and sale of each project. Current and past partners include; the department of environmental quality, the Army Corps of Engineers, the Bureau of Reclamation, the Natural Resources Conservation Service, Ducks Unlimited, and angler clubs. Additionally, the Aquatic Habitat Program works closely with local cities and towns as well as the



⁴ ibid

⁵ Magazine, N. (2018, July 05). Aquatic Habitat Program Celebrates 20 Years. Retrieved from <http://magazine.outdoornebraska.gov/2018/06/aquatic-habitat-program/>

⁶ ibid

State's twenty-three Natural Resource Districts (NRDs) which have the authority to levy local property taxes for irrigation, flood control and recreation.

Resource Investment

Resources from several agencies support the Aquatic Habitat Program. The Program Manager is a Nebraska Game and Parks Commission staff member. District Fisheries staff provide support for specific projects. Funding through the Aquatic Habitat Stamp is supplemented by fisheries and federal aid cost-sharing funds as well as 319 funding. Additional support is provided through the Nebraska Environmental Trust, a state-run entity that distributes state lottery funds through a grant program.

How Success Has Been Measured

Nebraska's Aquatic Habitat Program has identified the following output and outcome metrics to gauge their success:

Integration Outputs:

Goals are set each year for the number of projects completed. Funding sources are also tracked with a per-project cost analysis identifying the percentage of funding leveraged through the stamp verses additional resources. Angler surveys provide qualitatively reporting on the impact restoration projects have on fish communities and angler success.

Integration Outcomes:

In order to quantitatively track outcomes of restoration projects before and after fish sampling is conducted to identify specific distribution and abundance of target game fish and creel. This is supplemented by qualitative reports through fishermen surveys inquiring how many and what type of fish they catch as well as where they live, how many hours they spent fishing, and how many fish were caught per hour. This combined data depicts the structure of the fish community at each project site. Qualitative reporting on the impact of revitalization projects on wildlife is also utilized through staff observations noting decreases or increases of sightings. Additionally, some projects require further reporting on water quality parameters. Structural improvements that enhance fisheries and water quality also increase recreational use of the waters.



Furthermore, as public awareness of the Aquatic Habitat Program's success grows program staff are continually sought out for advice on improving fisheries, wildlife and recreation in other areas. Finally, the restoration projects undertaken by Nebraska's Aquatic Habitat Program also present an important opportunity to raise awareness and educate partners about water quality, recreational surveying, flood

control and irrigation. It is an opportunity to improve understanding of wetland management, fish communities and the use of vegetation to develop healthy habitats and improve water quality.

Impact on Watershed-level Planning, Implementation or Outcomes

While the large flood control projects of the 1950s and 60s have come to an end, there are still several projects under construction with partners like the Army Core of Engineers, NRCS, and local conservation districts. This integration process has had a significant impact on the planning and implementation of these projects. Today, fishing staff and other natural resource experts play a key role in the initial design and planning process working with engineers to ensure essential features are incorporated in construction which extend the life span of these waters and their fish populations. Special consideration is given to fishery accommodations such as where anglers get access, what wildlife might be used, building jetties, shoreline stabilization and shoals. Proactively incorporating these features is a more cost-effective approach when compared with the expense of restoration.

Cost Benefit Insights

While there has not been a formal cost-benefit analysis conducted on this project, the project leadership has been able to identify key benefits that have clear positive financial implications. There has been an increase in public use of restored reservoirs. For example, they are more pleasant to use and fishermen can walk on the jetties. Before and after fish data have shown increases in priority fish species abundance and size. Some of this information has been collected both at the state and the national level (National Fish and Wildlife Survey). Creel surveys that measure angler use days also have shown an increase in number of trips and associated purchases of lodging, gas and food. There have also been monies leveraged through collaboration that have resulted in increased and higher quality restoration projects occurring than would otherwise have been possible through individual agencies.

Other Impacts

In addition to the above-stated benefits, there have been downstream water quality improvements as water quality improved upstream. Not all benefits to this area have been accrued solely from the reservoir restoration projects, but these projects have contributed as part of a larger suite of improvements that reduce nutrients and sedimentation from upstream. The downstream area from Antelope Creek has now been removed from the impaired waters list for the state and a 100+ year rain event did not flood the business community for the first time since the restoration work was completed, resulting in huge savings in avoided flood damage and clean-up costs.

Information about Policy-related Issues

This collaborative project required Commission action. The Commission is a politically-appointed board. A bill had to be introduced to the state legislature to set up the required legislative action. The passing of

this bill was the primary driver for the project. It is important to note that timing was played a significant role in this set of political activities, as the state had formed an Environmental Trust at the same time.

Challenges & Lessons Learned

This project was designed to be adaptive in order to address emerging needs. The partners have improved the system over time, as well as the wetland fringe. Wetlands need periodic drawdowns to reestablish vegetation. New practices have evolved to allow a one-foot drawdown in the summer by providing deep areas next to shore that can be used by fishermen during drawdowns to support public demand and use. The incorporation of deep water near shore and jetty access has resulted in increasing interest and demand for this restoration work in other areas of the state.

Next Steps

The Aquatic Habitat Program is an ongoing initiative. As the program continues its restorative work, implementation of current best management practices and lessons learned from completed projects play a pivotal role. This includes revisiting earlier projects to make adjustments as needed. Additionally, to ensure new reservoirs incorporate features that extend their lifespan the program “provides technical assistance on reservoir design and construction methods, and sometimes financial assistance to incorporate in-lake fish habitat, shoreline angling areas and boating access to these new public waters.”⁷

Transferability

This integration project is most transferable in states with extensive land and a small population. Partnerships are essential to the success of the Aquatic Habitat Program. The support of the angler population is important when considering the implementation of an Aquatic Habitat Stamp to fund restoration projects.

Contact Information

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⁷ [Nebraska Aquatic Habitat Program Website](http://www.NebraskaWetlands.com)

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Additional Resources

- [Aquatic Program Website](#)
- Holmes Lake Water Quality Project 319 Report
- [Holmes Lake Restoration Factsheet](#)
- [Nebraska Land Article](#)
- Paper on how to incorporate wetlands into reservoir rehabilitation projects
- Legislation Link
- Wetland Program Plan – Wetland Management Document
- Fisheries Survey