**RFHP Meeting October 10-11, 2017**

**Presentation Abstracts**

**Reservoir Fisheries Habitat Restoration is too Big a Job for Any one Agency to Tackle: Partnering and the Friends of Reservoirs Role in its Promotion**

Jeff Boxrucker, Coordinator

Reservoir Fisheries Habitat Partnership

The task of restoring habitat in the nation's reservoirs is a multijurisdictional challenge and cost prohibitive for a federal and/or state agency to accomplish without partnering with other public and private organizations or individuals. The Reservoir Fisheries Habitat Partnership (RFHP) recognizes that reservoir fisheries habitat impairments are often extensions of poor land-use practices in the respective watersheds. RFHP works to bring agencies and local organizations and individuals together to address habitat impairments at the local scale. RFHP and the Friends of Reservoirs Foundation have a membership and grant program that encourages local groups to work with state fisheries biologists to ensure that projects enhance fisheries management plans. RFHP has conducted a habitat impairment assessment of reservoirs nationwide to help prioritize activities. Funded projects have focused on native vegetation restoration, structure addition and shoreline stabilization. Future projects look to partner with organizations to address watershed impairments to improve water quality and habitat in downstream impoundments.

**Friends of Reservoirs Website**

Amberle Jones

Arizona Department of Fish and Game

**Pennsylvania’s Division of Habitat Management**

Ben Page

Lake Habitat Section

Division of Habitat Management

Pennsylvania Fish and Boat Commission

 The Pennsylvania Fish & Boat Commission’s Division of Habitat Management consists of four sections. The Lake Section, Stream Section, Fish Passage Section, and Special Projects Section are customized to meet the needs of high priority habitat issues on various waters throughout the state. The PFBC staff uses the Cooperative Habitat Improvement Program (CHIP) and the Technical Assistance Program (TAP) to plan and execute organized fish habitat improvement projects. Projects vary in scope based on the specific water body, funding availablity, volunteer effort, machinery needs and access to the site.

**Leaser Lake Partnership: Grass Roots Organization Sets Model on How to Restore a Local Lake**

Randy Metzger

Leaser Lake Heritage Foundation

The Leaser Lake Heritage Foundation worked with the Pennsylvania Fish and Boat Commission (PFBC) to leverage funding from several sources including the Reservoir Fisheries Habitat Partnership to help rebuild the dam and complete an extensive fish habitat project at this lake. With several high-hazard dams owned by the PFBC, the process used for Leaser Lake dam reconstruction and habitat restoration is serving as a model for other conservancies in Pennsylvania. There are many steps that need to be taken as the PFBC rebuilds the dams, accesses and habitat at each of the PFBC lakes. The local conservancy group has proven to be an invaluable partner when communicating with legislators, organizing infrastructure plans, leveraging grant funds and gathering a volunteer labor force.

**Evaluation of Channel Catfish Spawning Success using Pennsylvania Channel Catfish Spawning Boxes**

Keith Beamer

Lake Habitat Section

Division of Habitat Management

Pennsylvania Fish and Boat Commission

Since the early 1990’s, the Pennsylvania Fish & Boat Commission (PFBC) has placed wooden channel catfish spawning boxes in several reservoirs in an effort to encourage natural reproduction in stocked channel catfish waters. From 2012 to present, multiple monitoring techniques have been used to document channel catfish reproduction in the boxes at five different Pennsylvania reservoirs. Monitoring at all five reservoirs showed that greater than 50% of the boxes were utilized at least once for spawning. At one reservoir 92% of the boxes hosted at least two spawning events in one season (May-August). The PFBC has now implemented a study plan at five reservoirs to measure the amount of channel catfish offspring from boxes that survive one to five years (<450 mm).

**Glade Run Lake Restoration and Habitat Improvement**

David Fowler

Glade Run Lake Conservancy-Friends of Reservoirs Chapter

Glade Run Lake is a 52 acre lake created by the Federal Government in 1954 for recreation and nature preservation. The 150 acre property, located just north of Pittsburgh, is owned by the State of Pennsylvania and administered by the Pennsylvania Fish and Boat Commission. The lake was drained in 2011 because of deficiencies in the dam. Glade Run Lake Conservancy was formed to assist in the restoration and improvement of the lake and adjoining property. Funding sources for lake restoration are in short supply. Nonprofit organizations face numerous hurdles in both the technical and political arenas. Glade Run Lake Conservancy, with the help of many other organizations, and a good deal of luck, was able to facilitate the restoration of the lake and dam in 2017. The various steps taken by the Conservancy to help with the refurbishment of the dam and the processes necessary to add significant habitat improvements to the lake will be examined. Future plans for habitat improvement and monitoring will be discussed.

**Obtaining Shell Grant and Implementing a Large Scale Lake Habitat Project on Lake Nessmuk**

Don Kelly

Tioga County Bass Anglers - Friends of Reservoirs Chapter

In 2013, Lake Nessmuk in Wellsboro, PA was drained for dam rehabilitation, creating an opportunity for a large scale fish habitat project.  In order to secure funding, Tioga County Bass Anglers worked with the Pennsylvania Fish & Boat Commission (PFBC) and the Friends of Reservoirs to apply for a grant from Shell Appalachia. PFBC habitat managers proposed a habitat plan and upon obtaining the grant, the plan was implemented with help from community volunteers.  Lake Nessmuk was refilled in 2016 following the completion of the dam rehabilitation and large scale habitat project.  Habitat improvement efforts continue with small scale habitat projects.

**Cave Run Lake Fish Habitat Project**

Thomas Timmermann, Joseph Zimmermann

Northeastern Fishery District, Habitat Branch

Kentucky Department of Fish and Wildlife Resource

Lake aging, which leads to habitat loss, is a problem fisheries managers have been dealing with for years.  In 2013, the Kentucky Department of Fish and Wildlife Resources implemented a large scale habitat project on Cave Run Lake, an 8,270 acre meso- to oligotrophic reservoir in eastern Kentucky.  The goals of this project were to increase angler opportunity through additional habitat sites on the lower two-thirds of the lake and to increase secondary trophic level organisms in this low nutrient system with slow growing fish populations.  Furthermore, with a limited budget, the managers of this project were tasked with accomplishing these goals through governmental and public partnerships.  Since the implementation of this project, thousands of structures were added to the lake, which has increased angler opportunities.  Additionally, early studies have shown increases in growth rates of black and white crappie on the lower portions of the lake.

**Reversing Habitat Loss in Reservoirs: No One Can Do It Alone**

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Impoundments across North America face the dilemma of habitat loss due to the natural aging process. The natural resource agencies who manage these impoundments are limited in what they can accomplish due to constraints in manpower and budgetary resources. These consequences ultimately affect the success of angler groups, who in turn have their own limitations on what they can do. With so many problems, it is imperative that all user groups collaborate to find solutions to achieve a common goal. Pymatuning Reservoir is a large, impounded reservoir that spans the border between northeast Ohio and northwest Pennsylvania. Since the Shenango River was dammed to create the reservoir in 1934, the lake has lost significant in-lake habitat, including the rocky debris and wooden stumps that served its highly successful fisheries. Such a large reservoir (5,929 ha surface area) requires an approach that will serve all its user groups and address both short term and long term goals. Each year, the natural resource agencies (Ohio Division of Wildlife, Pennsylvania Fish and Boat Commission) collaborate with various user groups (Pymatuning Lake Association, Crawford County Conservation District) on small scale projects (i.e. in-water fish cribs) and large scale projects (i.e. shoreline stabilizations). These collaborations work well in that the user groups benefit immediately from these projects since they serve as fish concentration devices. But over time, the natural resource agencies are hopeful that these placements will serve as viable fish habitat that has been degrading away for decades.

**Willard Bay Reservoir; the making of Strawberry Reef**

Kent Sorenson

Utah Division of Wildlife Resources

Flat water angling accounts for just over 5 million angling hours annually in Utah, the majority of that occurs on reservoirs. Augmenting warm/coolwater reservoir habitat in Utah has been previously uncharted territory. Willard Bay Reservoir is a freshened arm of Great Salt Lake generally devoid of much topographical relief. Creating additional habitat was viewed as a positive step to enhance angler opportunity and bolster consistency in angling efforts. Difficulties with the legal parameters of water, dam, surrounding land, etc. ownership and management have made for a maze of regulatory roadblocks that must be navigated prior to any habitat augmentation. Developing partnerships became key in moving the project forward. Garnering funds from traditional sources as well as a grant from Reservoir Fisheries Habitat Partnership allowed for the flexibility to spend/have partners spend the money in a more efficient manner. We chose to use a local company to ferry loads of rock to an offshore site and construct a ‘reef’ of sorts comprised of large boulders dumped directly from the trucks. Fifty truckloads of rock were dropped in a more or less linear fashion to add complexity to the substrate. Locations were publicized and a few anglers even waited until project completion before trying the new spot.

**Inspiring the Will to Revitalize a Reservoir**

Tom Lang,

Texas Parks and Wildlife Department

Built in 1901, Lake Wichita in Wichita Falls is the third oldest lake in Texas. Known as the “Gem of North Texas,” it has served the region as a recreation destination, as a social mecca, as a driving economic force, as a home for the wise-use and conservation of fish and wildlife resources and as a foundation for community growth by serving as a drinking water source. At 115, Lake Wichita is beyond its expected 100-year life span. The natural reservoir aging-process (among other issues) has led to its present state where it is no longer able to provide significant social, economic, ecological, or recreational benefits to the community. Lake Wichita has been plagued by Golden Alga fish kills, a drought of record started in 2010 and nearly completely dried up the 1,200-acre reservoir until torrential rains in May of 2015 refilled the lake. With these issues and an average depth of 4.5 feet at conservation pool Lake Wichita was essentially dead. In May 2013, the City of Wichita Falls established a Lake Wichita Study Committee to make recommendations to the City Council. As a result, the Lake Wichita Revitalization Project has been established with several key project partners; City of Wichita Falls, City of Lakeside City, Texas Parks and Wildlife Department, Wichita Falls Area Community Foundation, and the Lake Wichita Chapter of Friends of Reservoirs. Together these organizations have led a grass roots effort that has been growing in political, financial, and public support for a holistic plan to revitalize the lake. Partners and the public have varied interests but all have agreed that without rebuilding the lake of sufficient quality to support a fisheries resource, no other desires for amenities at the lake matter. This project includes a dry excavation of 8-million cubic yards of sediment, bathymetric construction that minimizes evaporation during drought, watershed restoration, placement of a plethora of fish habitat, fish restocking, fishing access, commercial development, recreational amenities, and wildlife viewing. This presentation will focus on the grass roots process and efforts that is leading to the success of this holistic and integrated lake revitalization; including inspiring partners, politicians, civic organizations, philanthropists, and the general public to actively work for the successful revitalization of the lake.

**Indiana’s New Reservoir Enhancement Program-**

Sandra Clark-Kolaks,

Indiana Department of Natural Resources

In many Midwest states, including Indiana, large reservoirs are highly utilized by anglers. Also, similar to most reservoirs in the Midwest, reservoirs in Indiana are aging and aquatic habitat is deteriorating or nonexistent. Indiana Department of Natural Resources (DNR) is working to create a reservoir aquatic habitat enhancement program similar to other Midwest states using artificial structures: crib structures, rock piles, Georgia cubes, brush piles, and felled shoreline trees. General recommendations of the number of structures to place in a complex (i.e. 20 cribs per acre) are widely available but the question of how much aquatic habitat is needed is still unanswered. Indiana DNR is attempting to use a quantitative measure of habitat enhancement by calculating a Habitat Enhancement Zone (HEZ). The HEZ is the surface area for the portion of the lake with adequate oxygen levels for fish but deep enough not to obstruct boats. The HEZ is calculated using detailed bathometric maps which are created using Lowrance HDS depth finder and BioBase software. All artificial structures will be placed within this HEZ. We created an impact acreage for structure complexes (i.e. 20 cribs per acre) based on an area slightly greater than the complex surface area due to habitat created along the edges of the structures. Other structures, like brush piles and felled shoreline trees; where documentation of surface area is not available, the best estimate of the area of habitat created was based on an area slightly larger than the structure (length of tree, etc.). Based on these individual structure impact acreages, Indiana DNR hopes to increase available habitat by 5% to 20% in the Habitat Enhancement Zone in project lakes.

**Establishing Aquatic Plants in Reservoirs: Why and How**

(Richard Ott – Texas Parks and Wildlife)

The role of plants in aquatic systems is significant. Aquatic plants provide valuable fish and wildlife habitat, serve as a food source for waterfowl and other aquatic wildlife, improve water clarity and quality, reduce rates of shoreline erosion and sediment re-suspension, and help prevent the spread of nuisance exotic plants. Typically, three different situations occur in large multipurpose reservoirs: 1) low abundance of vegetation, 2) low species diversity, or 3) remediation following control of nuisance exotic plant species such as hydrilla (*Hydrilla verticillata*). Because reservoir hydrodynamics, herbivore populations, and seed bank are vastly different from natural lakes, techniques have been developed to improve the chances of success in aquatic plant introduction programs in reservoirs.

In this presentation, I submit an approach for accelerating community succession using native aquatic plant founder colonies. By ensuring that propagules, such as seed or plant fragments, are present in sufficient numbers when conditions are suitable for natural establishment, the time required for vegetative colonization to occur is shortened. Recommendations for production of suitable propagules include their growth requirements, operation of production facilities, and selection of different propagule types by species. Recommendations for establishment of these propagules in reservoir ecosystems includes site selection, season of establishment, planting techniques, defining individual phases of an establishment project and monitoring and adaptive management after species are introduced.

Example schematics, material selection, and placement of protective exclosures necessary for initial establishment are discussed. Growth requirements and individual autecology for submersed, floating-leaved, and emergent species found to work best in the full range of environmental conditions present in Texas’ reservoirs are provided.

**Replacing Degraded Structure in Roosevelt Lake, Arizona**

Amberle Jones

Arizona Game and Fish Department

**Reservoir Rehabilitation Tactics: Lessons Learned from the Nebraska Aquatic Habitat**

**(tentative)**

Mark Porath,

Nebraska Game and Parks Commission,

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The large number of impoundments constructed over a half century ago, now present us with many challenges on how to address the impacts of time and declining aquatic habitat conditions on these aging reservoirs. Important as recreational opportunities and local economic drivers, reservoirs in Nebraska support over 80% of annual angling hours. Not surprisingly, Nebraska anglers were instrumental in supporting the establishment of an Aquatic Habitat Program with a license fee increase. Since 1997, Nebraska’s Aquatic Habitat Program has worked with over 60 funding partners to rehabilitate 35 reservoirs (four in progress) at a cost of over $54,000,000 dollars. Addressing impairments caused by sedimentation, nutrients, shoreline erosion, and out-of-balance fish communities has helped us develop a number of successful tactics to bring “New Life to Aging Waters”.

\*Waiting to hear from WV DNR and VA DIFG on presentation titles