Narrows Tailwater Management Plan

Based on Public Input from Facilitated Workshops, Non-Resident Angler Mail-in Questionnaires, and Fisheries Science

Prepared by
Fisheries Division
Arkansas Game and Fish Commission

In cooperation with
Narrows Tailwater Advisory Group

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Plan Mission Statement:

Improve fishing and boating recreation ion Narrows Tailwater by providing more diverse fishing opportunities, improving habitat, and optimizing the balance among warmwater, coolwater, and coldwater fisheries. Critical to the success of this plan is increased stakeholder involvement and communication. This plan will be implemented through an open public process that adapts to changing conditions.

Introduction

Narrows Dam is located on the Little Missouri River near Murfreesboro, Arkansas. The dam was built for the purposes of flood control and hydroelectric power generation and began operation in 1950. From Narrows Dam, the Little Missouri River flows approximately 61 miles to its confluence with the Ouachita River.

The upper 6 miles of the Narrows Tailwater has been managed primarily as a seasonal rainbow trout fishery. Below this trout water, the primary management focus is on coolwater and warmwater fish species. These species include smallmouth bass, walleye, channel catfish, and bream. The sport fisheries in Narrows Tailwater are managed by the Arkansas Game and Fish Commission (AGFC) under the authority of Amendment 35 to the Arkansas Constitution.

Purpose of the Plan

The purpose of this plan is to establish specific goals and objectives, which will guide the future management of Narrows Tailwater. These goals and objectives are designed to address, as extensively as possible, the desires and expectations of the public as they pertain to the management of the tailwater's sport fisheries. The deliverable elements of the plan are based on scientific fisheries principles and are intended to maintain and enhance fishing and recreational opportunities on Narrows Tailwater. The focus of this plan will be restricted to the 44 mile section of the Little Missouri River between Narrows Dam and the Highway 67 Bridge near Prescott.

Development of the Plan

In an effort to insure that management goals reflect the values and interests of the public, AGFC conducted a series of public workshops in November 2005 and January 2006. The purpose of these workshops was to identify issues and concerns that the public had regarding the Narrows Tailwater and to solicit advice on the best way to address those issues.

Another component of plan development was the organization of the Narrows Tailwater Citizen Advisory Committee (NTCAC). This group was formed in January 2006 and consists of 12 individuals representing a cross-section of stakeholder interests. The responsibilities of the NTCAC include assisting in the completion of the plan document, advising and assisting in the implementation of plan strategies, and to help in evaluating the success of the plan.

Dynamic Solutions Group (DSG), an independent consulting firm, was retained to facilitate the workshops and formation of the NTCAC.

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Plan Goals:

People Goals

GOAL # 1. **Develop an open and transparent management environment by improving communication with stakeholders and providing information to the public in a timely manner.**

GOAL # 2. **Improve angling and boating access by maximizing use at existing facilities and creating additional access where possible.**

GOAL # 3. **Maintain a high level of angler compliance with regulations to aid in achievement of management objectives.**

Habitat Goals

GOAL # 4. **Protect, improve, and restore physical habitat by working with riparian landowners and partner agencies.**

GOAL # 5. **Fine-tune improvements from Narrows Tailwater Enhancement Project to further benefit smallmouth bass and trout fishery.**

Fish Goals

GOAL # 6. Maintain and enhance coolwater and warmwater fisheries.

GOAL # 7 **Provide quality trout fishing opportunities while maintaining seasonal put-and-take trout fishery.**

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People Goals, Objectives, and Strategies

GOAL 1. **Develop an open and transparent management environment by improving communication with stakeholders and providing information to the public in a timely manner.**

Objective 1.1 **By 2012, hold 5 annual meetings to provide stakeholders with current scientific information and the status of implementation projects.**

Strategy 1.1.1. Work with the Narrows Tailwater Citizen Advisory Committee to plan and host annual meetings.

Objective 1.2 **By October 2007, create and maintain an informational website that includes the posting of recent Narrows Tailwater reports.**

Strategy 1.2.1. Work with District 7 Fisheries and Communication Division personnel to create and maintain informational website.

Objective 1.3 **By 2009, create new, standardized signs for all access areas on Narrows Tailwater.**

Strategy 1.3.1. Work with District 7 Fisheries and CERE Division personnel to create and construct standardized signs.

Objective 1.4. **Maintain open lines of communication/cooperation with other state and federal agencies by attending annual meeting of the Ouachita Basin Reservoir Workgroup.**

Objective 1.5. **Publish articles in Arkansas Outdoors, Arkansas Wildlife, and other popular literature and media highlighting the changes to fisheries management.**

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GOAL 2. **Improve angling and boating access by maximizing use at existing facilities and creating additional access where possible.**

Objective 2.1. **Ensure equitable distribution of bank and wade fishing pressure in the upper 6 miles of tailwater.**

Strategy 2.1.1. Use creel survey data to evaluate current distribution of bank and wade fishing pressure.

Strategy 2.2.1. Equitable distribution of fishing pressure will be achieved through Objective 2.2 and Objective 2.3.

Objective 2.2. **Maximize use at existing access by improving facilities for bank fishing, boat launching, and "park-and-play" paddling, as appropriate.**

Strategy 2.2.1. Improve bank-fishing facilities at River Ridge (Weir #1), Old Factory Site (Weir #2), Low Water Bridge (Weir #3), Nubbin Hill, and Hwy 67 access sites.

Strategy 2.2.2. Develop physically challenged angler access facilities where possible.

Strategy 2.2.3. Acquire land and further develop facilities at Old Factory Site Access (Weir #2).

Strategy 2.2.4. Explore possibility of building an angler access walk-bridge across river at Hinds Bluff.

Objective 2.3. **Create additional access for anglers and boaters.**

Strategy 2.3.1. Pursue creation of new access on west side of river between Hinds Bluff and Old Factory Site (Weir #2).

Strategy 2.3.2. Work with partners to create an angler access, walking trail from River Ridge Access to Hinds Bluff Access.

Strategy 2.3.3. Create access (bank fishing and boat launch) at Hwy 27 Bridge unofficial access on Arkansas State Highway and Transportation Department (AHTD) right-of-way.

Strategy 2.3.4. Acquire and develop access facilities and parking at Gilmer Bridge unofficial access.

Strategy 2.3.5 Explore possibility of gaining access and develop bank fishing and boat facilities at Hwy 195 Bridge.

Strategy 2.3.6. Acquire and develop access and facilities at Bowen Bridge.

GOAL 3. **Maintain a high level of angler compliance with regulations to aid in achievement of management objectives.**

Objective 3.1. **Achieve 95% angler compliance rate with fishing regulations.**

Strategy 3.1.1. Conduct high visibility river patrols as much as possible.

Strategy 3.1.2. Change regulations to require trout permit to fish from Narrows Dam to Low Water Bridge, as with White River system tailwaters.

Strategy 3.1.3. Acquire better canoes and / or kayaks for enforcement patrols.

Strategy 3.1.4. Assess level of angler compliance with creel survey beginning in December 2006.

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Habitat Goals, Objectives, and Strategies

GOAL 4. Protect, improve, and restore physical habitat by working with riparian landowners and partner agencies.

Objective 4.1. **Improve fish habitat in year-round Catch-and-Release Area by increasing minimum water depth to 1.8 feet.**

Strategy 4.1.1. Redesign "Skinny-water Habitat Improvement Project" with partners to include paddler's play-water.

Strategy 4.1.2. Partner funding to complete project with U.S. Army Corps of Engineers (USACE), Friends of Little Missouri River (FOLMO), Arkansas Canoe Club (ACC), Federation of Fly-Fishers (FFF).

Objective 4.2. **By 2010, create a habitat renovation and protection plan, which will be used to identify, prioritize, and plan future habitat projects. Plan will be designed and funded in cooperation with partners.**

Strategy 4.2.1. Determine the level of resolution and habitat variables needed in an inventory and assessment of physical habitat.

Strategy 4.2.2. Assess the personnel and equipment resources needed to complete the needed inventory and assessment to determine if it can be performed in-house or needs to be contracted.

Strategy 4.2.3. Conduct an inventory and assessment of fish habitat in Narrows Tailwater. If contracting this work is required, then funding should be shared with partners.

Strategy 4.2.4. Upon completion of the assessment, create a prioritized list of areas needing physical habitat improvement. Prioritization should be based on proximity to existing access areas to create better fishing for wade and bank anglers and "park-and-play" areas for paddlers.

Strategy 4.2.5. Upon completion of the assessment, create a map detailing problem bank erosion areas along with landowner contact information.

Strategy 4.2.5. Create a map detailing problem logjam areas that need to be removed to maintain a navigable channel for canoes small boats while preserving a sufficient amount level of habitat complexity.

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GOAL 5. **Fine-tune improvements from Narrows Tailwater Enhancement Project to further benefit smallmouth bass and trout fishery.**

Objective 5.1. **Provide a minimum flow of 50cfs. through tailwater during hot weather season.**

Strategy 5.1.1. Use existing water-volume agreement for pulse flows to fill weir pools in hot weather.

Objective 5.2. **Cool tailwater slightly to achieve 70 degrees F at Low-Water Bridge during warm seasons, while maintaining dissolved oxygen at state standard 6ppm throughout tailwater.**

Strategy 5.2.1. Use existing water-volume agreement for pulse flows to cool tailwater in hot weather.

Release options

All of these options are calculated on the existing agreement using water storage of 90,000,000 cubic feet.
None of these options provide for the enhancement project's objective of 50cfs minimum flow.
Any would require a minimum head on the turbine of at least 120 ft., which is a water elevation of 529 MSL.
Any of these release options would require a mixture of water of unit 3 with unit 1 or 2 to achieve fisheries objectives.

1. During the period July - August and on any day when releases have not been made during the previous 48 hours, provide a 6,000,000 cubic feet release up to a maximum of 15 releases.

Total 90,000,000 cubic feet. This option appears to be what was previously agreed to.

2. During the period July - August and on any day when releases have not been made during the previous 48 hours, provide a 1 hour and 50 minutes release at 900cfs up to a maximum of 15 releases.

Total 90,000,000 cubic feet. This option would produce less elevation change and produce slower flows that would be better for the fishery. It is within the parameters that were previously found to be acceptable.

3. During the period June 15 - September 15 and on any day that hydropower releases are not made, provide a 1-hour release (14:00-15:00) from unit 3 at 900cfs up to a maximum of 27 releases. It is likely that releases from unit 3 would also

require some form of aeration/oxygenation. If unit 3 is unavailable then make the release from unit 1 or 2.

Total 90,000,000 cubic feet. This option uses the same volume of water and would benefit both the trout fishery and the enhancement project.

4. During the period June 15 - September 15 and on any day that hydropower releases are not made, provide a 2-hour release (14:00-16:00) from unit 3 at 450 cfs up to a maximum of 27 releases. It is likely that releases from unit 3 would also require some form of aeration/oxygenation. If unit 3 is unavailable then make the release from unit 1 or 2.

Strategy 5.2.2. Possible solutions to dissolved oxygen and temperature to be used to achieve Objective 5.1.

Mix hydropower releases among Units 3 with 1 and / or 2 to provide 70 degrees F at Low-Water Bridge.
If pulse releases need to be from Unit 3 only, install hub baffles and block open valves for atmospheric air intake.
If pulse releases need to be from Unit 3 only, explore other aeration options for Unit 3.
Adjust trash-rack plating to slightly lower elevation to provide water release temperatures of 68˚F state standard at Low Water Bridge.

Strategy 5.2.3. Partner with USGS to install and operate a real-time temperature / dissolved oxygen gage at dam and a real-time temperature gage at Low-water Bridge to monitor water temperature and dissolved oxygen. Build in warning triggered at problem levels if possible.

Objective 5.3. **Explore potential to increase stream fertility to achieve better fish growth rates, without negatively affecting water quality.**

Strategy 5.3.1. Investigate potential for limestone sand application based on techniques used in Appalachian trout streams.

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Fish Goals, Objectives, and Strategies

GOAL 6. **Maintain and enhance coolwater and warmwater fisheries.**

Objective 6.1. **Develop a smallmouth bass population measurable by the following criteria.**

1. Narrows Dam to Weir 1

- **electrofishing catch rate of 15 fish/hour**
- **electrofishing catch rate of 0.4 fish/hour for fish > 356 mm (14 in)**
- **15% of black bass are smallmouth bass**

2. Weir 1 to Weir 3

- **electrofishing catch rate of 20 fish/hour**
- **electrofishing catch rate of 0.8 fish/hour for fish > 356 mm (14 in)**
- **30% of black bass are smallmouth bass**

3. Weir 3 to Billstown

- **electrofishing catch rate of 15 fish/hour**
- **electrofishing catch rate of 1.0 fish/hour for fish > 356 mm (14 in)**
- **20% of black bass are smallmouth bass**

Strategy 6.1.1. Stock spring or fall fingerling Ouachita strain smallmouth bass annually as is appropriate to Smallmouth Bass Species Management Plan.

Strategy 6.1.2. Smallmouth bass stocking will be distributed from Hwy 27 downstream to Hwy 195 to maximize developed fishery.

Strategy 6.1.3. Regulate smallmouth fishery as a trophy fishery with an 18-inch minimum length limit / one fish per day regulation to allow take of large smallmouth that have developed. Implement January 1, 2007.

Strategy 6.1.4. Continue standard fall electrofishing stream surveys to quantify relative abundance and fish community composition. See Appendix 1 for sampling protocol.

Strategy 6.1.5. Assess need to expand the fall electrofishing survey to areas not previously sampled.

Objective 6.2. **Achieve a catfish population with an electrofishing CPUE of 4.0 fish/hour below Billstown.**

Strategy 6.2.1. Annually stock catchable channel catfish in numbers consistent with Catfish Species Management Plan (20 catchables / mile) downstream of Hwy 27.

Strategy 6.2.2. Maintain current 10 fish/day creel limit regulation with no length restrictions.

Strategy 6.2.3. Continue standard fall electrofishing stream surveys to quantify relative abundance. See Appendix 1 for sampling protocol.

Strategy 6.2.4. Assess need to expand the fall electrofishing survey to areas not previously sampled.

Strategy 6.2.5. Perform an exploitation study using reward tags to determine the efficiency of catfish stockings.

Objective 6.3. **Achieve a walleye population with an electrofishing CPUE of 1.5 fish/hour below Highway 27 Bridge.**

Strategy 6.3.1. Every three years, beginning in 2006, stock Ouachita strain walleye in numbers consistent with Walleye Species Management Plan downstream of Hwy 195.

Strategy 6.3.2. Maintain current 6 fish/day creel limit regulation with no length restrictions.

Strategy 6.3.3. Continue standard fall electrofishing stream surveys to quantify relative abundance. See Appendix 1 for sampling protocol.

Strategy 6.3.4. Assess need to expand the fall electrofishing survey to areas not previously sampled.

Strategy 6.3.5. Perform an exploitation study using reward tags to determine the efficiency of walleye stockings.

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GOAL 7 **Provide quality trout fishing opportunities while maintaining seasonal put-and-take trout fishery.**

Objective 7.1. **Maintain an angler catch rate 0.8 – 1.0 fish/hour and an exploitation rate of 50% or greater for the seasonal rainbow trout put-and-take fishery.**

Strategy 7.1.1. Continue to stock approximately 87,000 catchable (mean length = 11 inches) rainbow trout from October through May (depending on water temperatures).

Strategy 7.1.2. Maintain current 5 fish/day creel limit regulation with no length restrictions.

Strategy 7.1.3. Quantify angler catch rates with a creel survey beginning in December 2006.

Strategy 7.1.4. Estimate angler exploitation of stocked rainbow trout with a creel survey beginning in December 2006 and a separate exploitation study beginning in January 2007.

Strategy 7.1.5. Use creel survey data to optimize rainbow trout stocking rates to achieve above criteria. This data will be available upon completion of the creel survey in December 2009.

Strategy 7.1.6. Use creel survey data to efficiently distribute rainbow trout to match spatial patterns of fishing pressure. This data will be available upon completion of the creel survey in December 2009.

Strategy 7.2.7. Occasionally stock large rainbow trout to provide a big fish component to the put-and take fishery, as hatchery space allows. Hatchery might have to reduce numbers of trout stocked to accommodate occasional large trout stocking.

Objective 7.2. **In the area from 100 yards below Narrows Dam to the upstream end of Riverside Park, maintain a catch rate of ≥ 1.0 fish/hour for rainbow trout.**

Strategy 7.2.1. Maintain existing year-round catch-and-release regulations within this area.

Strategy 7.2.2 Continue to restrict terminal tackle to single, barbless hook artificial lures within this area.

Strategy 7.2.3. Quantify angler catch rates with a creel survey beginning in December 2006.

Strategy 7.2.4. Use creel survey to estimate angler satisfaction with observed catch rates.

Strategy 7.2.5. Consider extending the existing year-round catch-and-release area farther downstream once Strategy 2.2.1 and Objective 5.2 are achieved.

Strategy 7.2.6. Research fisheries literature and U.S. Fish and Wildlife Service (USFWS) trout strain database for more thermally tolerant rainbow trout strains.

Strategy 7.2.7. Acquire, culture, and experimentally stock potential suitable strains only in quality trout management areas for evaluation.

Objective 7.3. **In the area from the upstream end of Riverside Park to the gas-line crossing above River Ridge pool, maintain a catch rate of ≥ 0.5 fish/hour for rainbow trout during the months of May-September.**

Strategy 7.3.1. Maintain existing summer catch-and-release regulations for this area.

Strategy 7.3.2. Quantify angler catch rates with a creel survey beginning in December 2006.

Strategy 7.3.3. Use creel survey to estimate angler satisfaction with observed catch rates.

Objective 7.4 **In the area from Hinds Bluff Access to Old Factory Site Access, achieve a mean length for rainbow trout of 13 inches at time area is re-opened to harvest.**

Strategy 7.4.1. Create a winter catch-and-release area from Hinds Bluff Access to Old Factory Site Access (see map and area description in Appendix A.).

Strategy 7.4.2. Regulate winter catch-and-release area as follows, beginning November 1, 2007:

Catch-and release for trout only from November 1st through the following April 30th, barbless artificial lures only.

From May 1st through the following October 31st, put-and-take regulations apply as in the rest of the river –

Strategy 7.4.3. Evaluate with creel survey, angler surveys, and fish population electrofishing samples.

Objective 7.5. **By 2009, develop year-round brown trout fishery by evaluating experimental stockings under the following criteria;**
1) survival as indicated by presence of brown trout in creel survey and annual fish population samples after 1 year post stocking 2) growth as indicated by brown trout attaining a mean length of 279 mm (11 in) by 2 years post stocking.

Strategy 7.5.1. Experimentally stock 6-inch fingerling brown trout in low densities in upper 6 miles in Winter 2006 & 2007.

Strategy 7.5.2. Distinguish each stocking cohort with a unique mark/tag to aid in evaluation of survival and growth.

Strategy 7.5.3. Protect brown trout with catch-and-release only regulation from Narrows Dam downstream to Low Water Bridge beginning January 1, 2007. This regulation will protect the brown trout from harvest until the initial evaluation of the brown trout fishery is complete in December 2008.

Strategy 7.5.4. Expand on existing standard fall electrofishing stream sampling to assess relative abundance, growth, and survival.

Strategy 7.5.5. Quantify angler catch rates of brown trout with a creel survey beginning in December 2006.

Strategy 7.5.6. Propose future brown trout management strategy in 2009.

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Appendix 1. Little Missouri River Long-term Sportfish Sampling Procedures

Basin Area Stream Survey (BASS) methods are used to collect sportfish data from the Little Missouri River. Boat electrofishing using a 14-ft johnboat is used to collect sportfishes. A Smith-Root Type VI rectifier is set at 840-1061 volts DC, 120 pps, 3-4 ms, and 4 amps. All sampling should be performed from mid-September through October when air temperature is less than 90 degrees F. All sampling is performed during the daylight hours during base-flow conditions.

All sportfishes should be collected, except longear sunfish and bluegill less than 150 mm TL are not collected. Nongame fishes should only be collected to make a species list. Sportfish collected are measured for total length (+ 1 mm), weighted (+ 1 g), and fin clipped.

Samples may be collected to evaluate changes in catch per hour or population estimates. Three-pass removal procedures have been used to estimate population size and biomass at most sites. Mark-recapture has historically been used at Billstown and weir pool 3. During all samples, the entire sample area should be electrofished.

Five primary sample sites include the Riverside pool (Old weir pool below Narrow's Dam), weir pool #1 (river ridge or above Hind's Bluff), weir pool #2 (old factory site), weir pool #3 (low water bridge or gravel washer), Billstown (Gilmer bridge or wooden bridge). Our goal is to sample all primary sites every 3-5 years. The primary sample sites should all be sampled during each year the river is sampled. The sample areas have been delineated in sampling reports from previous years.

Secondary sample sites include the stilling basin (immediately below the dam), Highway 67 Bridge, and Terrel access. These sites are sampled as time permits.

All data collected are entered into the BASS database. Standardized BASS outputs are computed using the BASS software (attached), which calculates the number of fish captured, the proportional stock density (PSD; Table 1), relative stock density (RSD), relative weight (Wr), young-adult ratio (YAR), mean catch per unit effort, and catch per unit effort by size group. All size structural indices are described in Filipek et al. (1994). The BASS software also calculates density and biomass estimates using the Chapman modification of the Petersen mark-recapture method, and associated 95% confidence intervals were based on the Poisson distribution (Filipek et al. 1994). Black bass catch per hour (CPH) and catch per hour for bass greater than 350 mm (14-inches) is evaluated and compared to statewide and ecoregion averages (Quinn, Wagner, and Filipek 2004).

Table 1. Length categories for black bass stock indices.

Species	Stock	Quality	Preferred	Trophy
Smallmouth bass	180 mm (7 inches)	280mm (11 inches)	350 mm (14 inches)	510 mm (20 inches)
Spotted bass	180 mm	280 mm	350 mm	510 mm
Largemouth bass	200 mm (8 inches)	300 mm (12 inches)	380 mm (15 inches)	630 mm (25 inches)

LITERATURE CITED

Filipek, S. P., and 7 coauthors. 1994. The Basin Area Stream Survey (BASS) System Manual. Arkansas Game and Fish Commission, unpublished report, Little Rock, Arkansas.

Quinn, J.W., B. Wagner, and S. Filipek. 2004. Characteristics of black bass populations in the rivers and streams of Arkansas. Stream Program Report STP2004-1. Arkansas Game and Fish Commission, Little Rock.