

# A Plan for Missouri Trout Fishing





# **A Plan for Missouri Trout Fishing**

**Prepared by the Trout Plan Committee:**

**Mike Kruse, Chairman**

**Bill Anderson**

**Andy Austin**

**James Civiello**

**Alan Daniels**

**Quenten Fronterhouse**

**Craig Fuller**

**Walt Hutton**

**George Kromrey**

**Dave Mayers**

**Kevin Meneau**

**Marlyn Miller**

**Kevin Richards**

**Terry Roberson**

**Bill Stimson**

**Chris Vitello**

**Norm Stucky**

**Dennis Steward**

**Dale Humburg**

**Dave Erickson**

**Approved by:**

**This plan was signed by the Director and Commission Chairman and  
accepted by the Conservation Commission at their regular meeting on October 9, 2003**

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**Stephen C. Bradford, Chairman  
Conservation Commission**

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**John D. Hoskins, Director**

## Executive Summary

Trout fishing is a popular activity in Missouri, accounting for about 14 percent of all angling effort. Trout habitat, however, is limited and only about 145 miles of cold streams and Lake Taneycomo are currently managed as year-round trout fisheries. Because trout fishing is so popular, and the resource is so limited, a plan is needed to ensure the most efficient and effective management of the statewide program.

Trout fishing sustains a large recreational industry in Missouri. Based on Department surveys of angling use, the Lake Taneycomo trout fishery is estimated to be worth approximately 13.3 million dollars per year to the local economy. Missouri's popular trout parks each support a variety of local businesses including motels, campgrounds, restaurants and tackle stores. Many trout fisheries are also popular float fishing streams that support canoe rentals, shuttle services, lodging, campgrounds, fishing tackle shops and guiding services for anglers.

Missouri's trout program began in 1878 when the first salmonids were released. A variety of species were stocked in many different waters until 1937 when the Missouri Department of Conservation was established. At that time, trout stocking was restricted to cold streams in three state parks and five other trout management areas open to public fishing.

Missouri's current trout program consists of four trout parks, seven trout management areas, five special trout management areas, eight wild trout management areas, Lake Taneycomo and winter trout fisheries in twenty urban lakes of St. Louis and Kansas City. Costs of raising and stocking trout are supported by anglers who purchase daily trout tags for fishing in trout parks and an annual trout permit for possessing trout in other areas and fishing the trout parks during the winter catch-and-release season. This program provides a variety of trout fishing opportunities. Trout parks are stocked daily and provide consistently high catch rates for a variety of angler types in easily-accessible streams. Trout management areas are stocked less frequently, but provide opportunities to catch and harvest trout in a more natural setting. Special trout management areas have special angling restrictions that limit harvest, sustain higher catch rates and provide opportunities for catching larger trout. Lake Taneycomo is the largest body of coldwater habitat in Missouri and receives more hatchery-reared trout and more trout angling trips than any other location. A combination of restrictive harvest regulations and intensive stocking provides both harvest and trophy fishing opportunities. Wild trout management areas are rarely stocked and trout populations and fishing are normally supported by natural reproduction of rainbow trout. Urban winter trout management areas are stocked during the cold months of the year to provide easily-accessible trout fishing opportunities in impoundments near large population centers.

Most of Missouri's trout fishing is provided by stocking hatchery-reared trout. Approximately two million trout are reared in five Department of Conservation hatcheries, Neosho National Fish Hatchery and occasionally other federal hatcheries. Department hatcheries are located at the four trout parks and near the upper end of Lake Taneycomo. Most are old facilities that vary widely in size, water supply and capacity to produce trout. Because demand for trout is high, the five Department hatcheries are operated as a unit, and fish are routinely moved between facilities to take advantage of the best growing conditions at any given time. Trout are also produced in privately-owned hatcheries and stocked in private fee-fishing waters or sold as food fish.

A large number of Department personnel work in the trout program. Approximately 60 Fisheries Division employees are directly involved in trout culture and management. Protection Division employees enforce trout fishing regulations in the 18 counties where Department-managed trout fisheries are found. Resource Science Division staff provide research and program support.

Limited coldwater habitat and a limited supply of hatchery trout are the biggest constraints to expanding or improving trout fishing opportunities in Missouri. Acquisition of more coldwater habitat for public use and expansion of trout production facilities depend on a limited supply of income from Department revenues and donations from private conservation groups. A variety of social issues complicate trout management including conflicts between different kinds of trout anglers, conflicts between anglers and other resource users, controversies regarding trout fishing regulations and demographic changes within the angling population. In addition to these

challenges, biologists manage trout populations amidst changing climate patterns, a variety of natural predators, concerns for native aquatic life and sometimes without adequate data on trout habitat and angler interests. Despite these challenges, a number of opportunities exist for expanding and diversifying trout fishing in Missouri.

The following plan provides a vision and an outline for how Missouri's trout program should be managed over the next decade. The overall vision is to provide the highest quality trout fishing experience that can be offered. The plan includes goals and objectives that will focus Missouri's trout program on three priorities – we want more trout anglers to have successful fishing trips, we want to spread the harvest of trout more equitably among all trout anglers, and we want to provide additional trout fishing opportunities for Missouri anglers. Many of these goals and objectives depend on the availability of funding, approval by the Conservation Commission and the Department's Regulations Committee, and acceptance by potentially-affected interests.

This plan was written by a team of employees from the Department's Fisheries, Protection and Resource Science divisions, and then extensively reviewed. Three public focus group meetings were held in early 2003 to solicit review from anglers, agency partners and others interested in Missouri's trout program. A summary of comments received from this review process as well as a list of focus group participants are found in the Appendix. After all input was considered by an editorial team, the draft plan was reviewed again by staff from five Department divisions and the Director's office.

#### Plan Summary:

The mission of the trout program is:

*Provide anglers with diverse, quality trout fishing opportunities consistent with overall sound management of our state's aquatic life.*

The goals and objectives of the trout program are:

**Goal 1. Maintain quality trout fishing opportunities in trout parks, Lake Taneycomo, and the existing trout management, special trout management, wild trout management and urban winter trout management areas.**

*Objectives:*

- 1.) Refine our policy of managing fisheries based on habitat capability and social factors (p. 9).
- 2.) Reduce the statewide daily limit from 5 to 4 in the aggregate (p. 9).
- 3.) Provide enhanced year-round fishing success in trout management areas (p. 10).
- 4.) Review management of all special trout management areas (p. 10).
- 5.) Review management of all wild trout management areas (p. 10).
- 6.) Review, clarify and simplify trout fishing regulations (p. 11).
- 7.) Evaluate trout areas for accessibility for a wide range of users (p. 11).
- 8.) Conduct an angler survey focused on trout fishing and the trout program (p. 11).

**Goal 2. Increase the number of trout available for stocking in coldwater streams and lakes.**

*Objectives:*

- 1.) Increase trout production at the Department's coldwater hatcheries by 20 percent (p. 11).
- 2.) Produce catchable-size rainbow trout that average 12.5 inches annually with a range of 10.0 to 14.0 inches and no more than 5% less than 10.0 inches (p. 12).
- 3.) Continue to provide assistance to private fish culturists (p. 12).
- 4.) Evaluate the role of private and cooperative trout production (p.13).

**Goal 3. Increase the amount of coldwater habitat available for public trout fishing.**

*Objective:*

- 1.) Acquire, by purchase or easement from willing sellers, public access to an additional 10 miles of coldwater streams by fiscal year 2008 (p. 13).
- 2.) Implement a coldwater stream easement program (p. 13).

**Goal 4. Enhance and diversify trout fishing opportunities.**

*Objectives:*

- 1.) Expand winter trout fishing opportunities in additional impoundments (p. 14).
- 2.) Increase emphasis on catch-and-release opportunities in the trout parks (p. 14).
- 3.) Pilot a winter catch-and-release season at one or more trout management areas (p. 14).
- 4.) Determine the feasibility of diversifying the size distribution of rainbow trout available for put-and-take stocking (p. 15).
- 5.) Create at least one new year-round trout area (p. 15).
- 6.) Investigate the use of new strains or species of trout that may hold potential for improved management or diversified fisheries (p. 15).
- 7.) Minimize effects of new trout fisheries on cold water ecosystems (p. 15).

**Goal 5. Enhance funding of the trout program.**

*Objectives:*

- 1.) Require a trout permit for fishing in designated trout waters (p. 16).
- 2.) Continually review the price of trout permits and daily trout tags for adults to raise the cost of permits as required to support quality trout fishing opportunities in Missouri (p. 16).
- 3.) Build partnerships with private conservation groups to help support the trout program (p. 16).

**Goal 6. Provide special trout fishing opportunities designed to increase recruitment of new anglers.**

*Objectives:*

- 1.) Integrate Fisheries Division's strategic plan for angler recruitment into the trout program (p. 17).
- 2.) Increase the number and improve the geographic distribution of impoundments managed for winter trout fishing (p. 17).
- 3.) Create additional youth-only fishing opportunities at trout parks, trout management, urban winter trout management and other Department areas (p. 17).
- 4.) Encourage special fishing opportunities for physically and developmentally-challenged anglers (p. 17).

**Goal 7. Improve communication with resource users and agency partners.**

*Objectives:*

- 1.) Maintain frequent contact with trout angling groups and agency partners (p. 18).
- 2.) Provide information about trout fishing opportunities, trout management and regulation enforcement (p. 18).

**Goal 8. Provide substantial enforcement effort by Protection Division personnel on all managed trout waters.**

*Objectives:*

- 1.) Maintain frequent routine patrols of trout management areas, using both high profile and low profile patrol techniques. Trout regulation enforcement will be a special area of emphasis for Protection Division, and will be reflected in region and individual work plans in applicable parts of the state (p. 18).
- 2.) Utilize personnel from other districts, regions, and divisions to assist with special patrols during high activity periods (p. 18).

## **Introduction**

Trout fishing is a popular outdoor activity in Missouri. Anglers rate trout as the fourth most popular species in the state, and about 16 to 22 percent of Missouri anglers fish for trout (Pullis and Laughland 1999; United States Department of the Interior 2003). A wide variety of trout fishing opportunities are available, ranging from easily-accessible urban ponds stocked with hatchery trout to challenging stream fishing for wild trout.

Maintaining quality trout fishing is a high priority of the Missouri Department of Conservation and considerable resources are devoted to trout production and management. The Department's Fisheries Division leads the trout program and is assisted by other divisions and sections, particularly Protection, Resource Science and Design & Development, in its efforts. The trout program depends on several important partners including the Missouri Department of Natural Resources, United States Forest Service, National Park Service, United States Fish and Wildlife Service, James Foundation, Neosho National Fish Hatchery, United States Department of the Army and a variety of city and county governments. The Department also works with private conservation and angling groups with interests in trout fishing, including Trout Unlimited, Federation of Fly Fishers, Missouri Trout Fisherman's Association, Conservation Federation of Missouri and Missouri Conservation Heritage Foundation.

While trout fishing is popular, trout habitat is very limited in Missouri. Of the 34,700 miles of permanent streams, only 377 miles are designated suitable for a "coldwater sport fishery" by the Missouri Clean Water Commission and only about 145 miles of these streams are actively managed for trout fishing by the Department.

This limited habitat supports not only intense angler interest, but a large recreational industry dependent on trout fishing. Fishing in general supported \$745,514,000 in expenditures in 2001, a year when about 16 percent of Missouri anglers fished for trout (United States Department of Interior, 2003). Based on Department surveys of angling use, the Lake Taneycomo trout fishery is estimated to be worth approximately 13.3 million dollars per year to the local economy. Missouri's popular trout parks each support a variety of local businesses including motels, campgrounds, restaurants and tackle stores. Many trout fisheries are also popular float fishing streams that support canoe rentals, shuttle services, lodging, campgrounds, fishing tackle shops and guiding services for anglers.

Because trout fishing is so popular, coldwater resources are so limited, and so many groups are involved in its management, a carefully-designed plan is needed to ensure that both natural resources and agency efforts are used as efficiently and effectively as possible. The purpose of this document is to guide trout management in Missouri into the next decade and beyond.

## **History of Missouri's Trout Program**

Trout fishing has been part of Missouri's outdoor heritage for most of the state's history. However, trout are not native here, and when the Missouri territory was granted statehood in 1821, no trout were swimming within its boundaries. At that time, the nearest salmonids were brook trout in what is now northeast Iowa, though limited fossil evidence suggests that salmonid fishes may have existed much further south, perhaps in Missouri, during the last glacial advance.

Early settlers from the eastern United States might have been surprised that there were no trout in the cold, clear waters of the Ozarks. Perhaps as a result, trout introduction was one of the first acts of fisheries management in Missouri, beginning not long after the Civil War. In 1878, the Missouri Fish Commission purchased "California salmon" eggs from the United States Fish Commission (Turner 1979). Salmon fry were stocked in tributaries of the Missouri and Mississippi rivers in an attempt to create a spawning migration from the Gulf of Mexico to Missouri. Brook trout were stocked in streams adjacent to the Frisco railroad line between St. Louis and southwest Missouri in 1879. Rainbow trout eggs were first purchased from the U.S. Fish Commission's McCloud River Station in California in 1880. By 1887, rainbow trout were naturally reproducing in Missouri (Maynard 1887).

Missouri's first coldwater hatchery was constructed on Brown's Spring near St. Joseph, Missouri in 1879, but it was closed in 1916 due to water supply problems. During the period 1889 to 1922, brown trout (1890), lake trout (1890), several species of Pacific salmon (1896), grayling (1896) and Atlantic salmon (1902) were reared at the Neosho National Fish Hatchery.

Missouri's first successful state-owned trout hatchery was built in 1921 at Sequiota Spring near Springfield. Rainbow trout and other stream fishes were reared and stocked from this facility until Shepherd of the Hills Hatchery opened in 1958. The State of Missouri began purchase of Bennett Spring in 1924 and the Missouri Game and Fish Commission began operating the hatchery in 1927. Montauk was acquired in 1928 and the hatchery began operation in 1932. Roaring River and its existing hatchery were donated to the state of Missouri in 1928. The cooperative agreement to manage Maramec Spring as a trout fishing area was initiated in 1958.

With the establishment of the Missouri Department of Conservation in 1937, the modern era of trout management began. Stocking was concentrated in cold water streams in three trout parks and five trout management areas which were open to public fishing. From these beginnings, the program gradually expanded. Hatchery production increased, allowing more areas to be stocked and a greater diversity of trout fishing opportunities became available to Missouri anglers. Recent examples of this diversity include the establishment of wild trout management areas in 1982 and the first urban winter trout management areas in 1990.

### **Current Programs**

The trout program now includes four trout parks, seven trout management areas, five special trout management areas, eight wild trout management areas, Lake Taneycomo and twenty urban winter trout areas in St. Louis and Kansas City lakes. In addition, there are trout fishing opportunities on private land that are not managed by the Department.

Costs of operating Missouri's trout program have traditionally been paid by trout anglers and as a result, special permits are required for trout fishing. All anglers fishing in the trout parks must purchase a daily trout tag which presently costs \$3.00 for anglers age 16 and older or \$2.00 for those 15 years and younger (Tables 1 and 9). A trout permit is required to possess trout taken from waters outside a trout park, but is not required to fish if all trout caught are immediately released. A trout permit is also needed for an angler to fish in the trout parks during the winter catch-and-release season. Trout permits cost \$7.00 and are valid for an entire license year which runs from March 1 through the end of February of the following year (Table 2). Like all other fishing and hunting permits, proceeds from the sale of daily trout tags and trout permits are received as general Conservation Commission Fund revenues. They are not reserved exclusively for trout production or management expenses. However, the Department has traditionally set prices to offset the direct costs of trout production and stocking.

### *Trout Parks*

The four trout parks are located in publicly-accessible parks. Bennett Spring, Montauk and Roaring River are state parks operated by the Missouri Department of Natural Resources; Maramec Spring is operated by the James Foundation, a not-for-profit, private organization. Operation of the trout parks and hatcheries would be impossible without a close cooperative relationship with these partners. Trout production, stocking and enforcement of fishing regulations in each park are conducted by the Missouri Department of Conservation. At each of the state parks, a State Park Stream Management Team, made up of two MDC employees and two DNR employees, develops, coordinates and implements a stream management plan that serves as a guide for stream related activities in each park. These activities may include, but are not limited to: habitat improvement, riparian corridor management, streambank stabilization, water quality monitoring and special educational efforts. The parks have approximately 8.2 miles of stream, all of which are fed by large springs (Table 3). Approximately 60 percent of all trout produced in Department of Conservation hatcheries are stocked in the four trout parks.

The trout parks are managed with the multiple objectives of providing consistently high success and catch rates in easily-accessible fishing areas in pleasant surroundings. The parks also provide a diversity of fishing experiences with some stream segments managed for fly-fishing-only, bait-fishing-only, catch-and-release fishing only, or areas open to fishing with all legal methods. Catchable-size rainbow trout, generally 10 to 14 inches, are stocked nightly at each trout park during the March 1 through October 31 fishing season, at a rate of 2.0 - 2.25 trout per anticipated tag sale. In years when production of brown trout exceeds stocking needs in other areas, browns may be substituted for a portion of the rainbow trout allocation. On weekends from the second Friday in November through the second Sunday in February, the trout parks are open for catch-and-release fishing only. Angling is restricted to flies only



and anglers must have an annual trout permit to fish. The trout parks are intensively managed and intensively fished, but provide predictable fishing for anglers who enjoy the surroundings and atmosphere of the parks. They are Missouri's most popular trout fishing destinations and each park has a loyal following of anglers. It is common for trout park anglers to fish frequently at one particular park and nowhere else.

#### *Trout Management Areas*

Sections of seven streams are designated as trout management areas (Table 4). Trout management areas provide a consistent opportunity to catch and harvest hatchery produced trout in a more natural and less crowded setting than a trout park. The daily limit is five trout, with no length limits or tackle restrictions.

#### *Lake Taneycomo*

Lake Taneycomo is managed more intensively than the trout management areas and is the largest special trout management area. Because of its size (2,080 acres), location near the popular tourist area of Branson and reputation for good trout fishing, more trout are stocked on a more frequent basis than at other areas. It is Missouri's largest body of coldwater habitat, receives more hatchery trout than any other area, and supports more than 200,000 fishing trips per year. About 675,000 - 750,000 rainbow trout are stocked each year in Lake Taneycomo along with 10,000 brown trout. The upper three miles are specially-managed to allow a portion of the stocked rainbow trout to grow to larger sizes. In this area, all rainbow trout from 12 to 20 inches must be released and fishing is restricted to artificial lures and flies to limit the mortality of released trout. There is a lakewide 20-inch minimum length limit and one fish daily limit on brown trout.

Shepherd of the Hills Hatchery located adjacent to Lake Taneycomo immediately below Table Rock Dam, supplies most of the trout stocked in the lake. Lake Taneycomo also receives approximately 225,000 trout per year from Neosho National Fish Hatchery.

#### *Special Trout Management Areas*

Five special trout management areas are managed with special fishing regulations and stocking practices to produce higher catch rates and the opportunity to catch larger trout compared to trout management areas (Table 5). All of these areas are stocked with 8- to 11-inch brown trout, usually once each spring or fall. Minimum length limits of 15 or 18 inches protect the recently-stocked trout from immediate harvest, sustain high catch rates and allow some trout to grow to large sizes. Some areas have restrictions limiting tackle to artificial lures and flies only. Brown trout are the dominant species in most areas, but rainbow trout are also present in each stream.

#### *Wild Trout Management Areas*

Eight wild trout management areas are managed to provide an opportunity for anglers to catch wild, naturally-reproduced, rainbow trout (Table 6). These stream areas are generally not stocked, though trout of hatchery origin from nearby stocked areas may be present in some streams and occasional stockings have been made to augment the wild population in the Eleven Point River. Eighteen-inch minimum length limits or catch-and-release fishing regulations protect most trout from harvest to ensure that adult trout can survive to spawn and maintain the populations. Only artificial lures and flies may be used in these areas.

#### *Urban Winter Trout Management Areas*

Twenty urban lakes and ponds in the Kansas City and St. Louis metropolitan areas are stocked during the cool months to provide trout fishing opportunities near large population centers (Table 7). Some lakes are managed as purely put-and-take fisheries, while others are managed for catch-and-release fishing then opened to harvest under statewide regulations. In catch-and-release areas, fishing is restricted to artificial lures, flies and unscented soft plastic baits. In St. Louis, the catch-and-release season in selected lakes runs from November 1 until January 31. At Coot Lake near Kansas City, the catch-and-release season is from November 1 through February 19. These "delayed harvest" areas maintain higher catch rates after stocking, yet still provide harvest opportunities at the end of the catch-and-release period.

### *Licensed Trout Fishing Areas*

A number of privately-owned springs, spring-fed streams and spring-fed ponds are stocked with trout and are available for fishing on a fee basis. Some areas raise and stock catchable-size trout from their own hatcheries, others purchase smaller fish and rear them to larger sizes on site, while others purchase catchable-size trout and release them to create immediate fishing opportunities. Anglers may be charged by the pound for fish they catch and keep, or they may pay for the opportunity to catch and release trout. Private trout fishing areas must meet requirements listed in the Wildlife Code, and the operators must agree to a set of operating rules and purchase a Licensed Trout Area Permit (annual fee is \$100.00). These requirements are designed to protect Missouri's public trout fisheries and other aquatic resources, while allowing private individuals to create trout fishing opportunities.

### *Other Trout Populations*

Trout populations exist in a number of other streams in the Ozarks that are not specifically managed for trout. These range from populations of wild trout that have been self-sustaining for many years through natural reproduction to stray individuals that migrate from hatcheries or stocked areas. Nearly all of these populations are found in streams that flow through private land. Some of these streams could support new trout management areas if public ownership or fishing access could be acquired. Such potential may exist in about 10 different areas covering approximately 45 miles of streams. Currently, trout harvest in these areas is governed by the statewide five fish daily limit.

### **Missouri's Trout Hatcheries**

Missouri's state, federal and private hatcheries produce approximately 2.8 million catchable-size rainbow trout each year. Missouri Department of Conservation facilities annually produce approximately 1.75 million trout weighing about 1.2 million pounds and measuring at least 10 inches. Among state hatchery systems, Missouri ranks 4<sup>th</sup> nationally in the weight of catchable-size trout produced and ranks 10<sup>th</sup> by total number produced (Epifanio 2000). Neosho National Fish Hatchery produces approximately 250,000 trout and private trout hatcheries produce about 800,000 catchable-size trout per year.

The Department of Conservation operates five trout production facilities with one at each of the four trout parks as well as Shepherd of the Hills Hatchery on upper Lake Taneycomo. These facilities vary in their size and ability to produce trout (Table 8). Water supplies at the four trout park hatcheries come from large springs while Shepherd of the Hills receives water from a deep intake located within Table Rock Dam. Missouri's state hatcheries are operated as one unit. Trout are routinely moved between hatcheries to meet stocking demands and to maximize use of hatcheries with the best flow, temperature conditions and space at any given time. As such, conditions at one hatchery can influence the availability and/or quality of trout in the entire system.

The Department's trout hatcheries are mostly old facilities, and it has been about 25 years since the last major renovation project. Some raceways were constructed as early as the 1930s by the Civilian Conservation Corps. Major capital improvements have been minimal since Shepherd of the Hills Hatchery was renovated in 1978.

The Department of Conservation maintains two strains of rainbow trout broodstock. The Missouri strain traces its origin to some of the original introductions of trout from California's McCloud River. While it is possible that some mixing with other strains has occurred, genetic analysis suggests that the Missouri strain is similar to other McCloud-derived populations, including the trout of Crane Creek. The Missouri strain is a "fall" spawner, with egg collections beginning in October and extending to December at Shepherd of the Hills Hatchery and Bennett Spring Hatchery. In 1986, the Missouri-Arlee strain of rainbow trout was developed at Shepherd of the Hills hatchery by crossing Missouri strain and "Donaldson" strain rainbow trout. It spawns from January to March and is currently maintained at both Shepherd of the Hills and Roaring River hatcheries. This later spawning period helps the hatchery system efficiently produce catchable-size trout throughout the year.

Missouri's brown trout are from the Sheep Creek strain that was derived from the Flaming Gorge Reservoir of Utah and Wyoming. Currently, a captive population of brown trout broodstock is not maintained in the Department hatchery system. Adult brown trout from Lake Taneycomo are captured as they ascend the effluent streams from the Shepherd of the Hills Hatchery each fall. After spawning, these fish are released. All brown trout stocked in Missouri originate from Shepherd of the Hills Hatchery. There, earthen raceways and a large pond have proven to be the best locations for producing brown trout. Browns tend to retain wilder behavior than rainbows and require more space and less disturbance for successful rearing to a release size of 8-11 inches.

Water supplies are an important feature of the production facilities. Production at Roaring River is often limited by low spring flows, and at those times a recirculation pump is needed to maintain sufficient flow. Montauk and Bennett Spring hatcheries operate under gravity flow from natural springs and hatchery supplies are reduced proportionately when spring discharge is low. A similar gravity flow is used at Maramec Spring but only a small percentage of the average flow is diverted through the production pools. Shepherd of the Hills Hatchery is Congressionally-authorized to remove 22 cfs from Table Rock Lake. However, use of this water is maximized with a passive recirculation system that uses natural head pressure in the water supply line to re-circulate water through the raceways. Water temperatures from spring sources are usually 56°-58° F, while water supplies from Table Rock Lake at Shepherd of the Hills can range from 40°-60° F. Shepherd of the Hills uses water from a deep well and water chillers to moderate conditions for egg incubation and the rearing of young trout.

Water quality problems can lead to increases in fish diseases which complicate hatchery operations. Outbreaks of bacterial gill disease are common in fingerlings and fungal infections cause losses of eggs. Usually these outbreaks can be treated but losses are occasionally high. Some facilities have a history of positive testing for bacterial kidney disease, but clinical outbreaks are rare. The Maramec Spring system is infected with parasitic copepods (*Salmincola spp.*), so trout reared or stocked anywhere in the Meramec River drainage are never transferred to other hatcheries within the state. Some private hatcheries in Missouri also contain parasitic copepods as well as enteric redmouth bacteria. Whirling disease has never been documented from any trout within the state of Missouri.

Neosho National Fish hatchery, established in 1888, is the oldest fish hatchery in Missouri and the oldest operating federal hatchery in the nation. Annual production averages approximately 225,000 9.5- to 10-inch rainbow trout weighing about 90,000 pounds. The hatchery operates on about 3 cfs of flow that originates from four different springs. Rearing facilities include indoor rearing tanks, 16 outdoor raceways and three 0.25- 0.5-acre earthen ponds. Neosho's trout are stocked into Lake Taneycomo, as mitigation for the loss of the warmwater fishery that occurred after the completion of Table Rock Dam. Neosho receives eggs from a variety of other federal hatcheries so many different strains of trout are reared and stocked.

Private trout hatcheries operate on several large springs in the Ozarks. Currently, there are approximately 10 private hatcheries in the state, and their combined annual production is approximately 1.4 million trout. About 800,000 trout are reared to catchable-size and sold for recreational fishing or private stocking in Missouri and a number of other states. The rest of the private production is sold as food fish to restaurants and grocery stores. Missouri is a trout exporting state and ranks approximately 10<sup>th</sup> among the states in privately-produced trout. Trout importation is regulated by rules in the Wildlife Code of Missouri to protect the state's trout populations and hatcheries from the spread of diseases.

## **Personnel**

The trout program directly involves Department employees from Fisheries, Resource Science and Protection divisions. Overall administration is the responsibility of the Fisheries Division Administrator with assistance from the Field Operations Chiefs. Currently, trout fisheries are present in five of the Department's eight regions. As a result, five Fisheries Regional Supervisors and ten Fisheries Management Biologists are involved in trout management. In addition, a number of other regional staff assist with population sampling, habitat enhancement projects and stocking as needed. The amount of time devoted to the trout program by regional staff depends on the number of trout fisheries within the region. Resource Scientists conduct research studies and provide information or program support as needed. A Fish Pathologist assists public and private fish culturists with fish health issues. The five trout hatcheries are supervised by a Coldwater Hatcheries Supervisor and operated by five hatchery managers and 36 other permanent employees.

Enforcement of trout fishing regulations is provided by staff from Protection Division. The Department generally employs one or two Conservation Agents per county and trout fisheries are found in 20 counties. The amount of time devoted to the trout program by Conservation Agents depends on the number of trout fisheries in a county and the amount of fishing effort they receive.

Design and Development Section contributes design, engineering and construction expertise to the trout program by working to improve and maintain trout hatcheries and fishing access areas.

### **Future Challenges and Opportunities**

**Limited Supply of Trout:** The Department's hatchery system is currently operating near maximum capacity. This limits the opportunities for expanding and diversifying trout angling opportunities and also places the trout program at risk in the event of a catastrophe at one or more hatcheries. Risks include floods that can inundate hatcheries and allow trout to escape. Floods may also cause trout mortality when warm, turbid water enters raceways. Shepherd of the Hills Hatchery operates under the constant risk of blockage to the main water intake structure on the upstream face of Table Rock Dam. Operating hatcheries at capacity frequently requires trout to be "pushed," an undesirable situation where trout are fed heavily to maximize weight gain. Such practices reduce food conversion efficiency and produce fish that are in less than optimal physical condition, stress easily during transport, and do not fight as well for anglers. To raise more trout for an expanded trout program and to protect the quality of existing programs, hatchery production capacity will need to be increased and new technologies should be incorporated.

**Limited Trout Habitat:** Of the 145 miles of streams actively managed for trout fishing by the Department, only about 75 miles adjoin or flow through public land. Because public access is limited, fishing pressure is concentrated in smaller stream reaches. Expansion of trout fishing opportunities to other coldwater stream reaches would help disperse angling pressure, but this may not be possible because these areas lack public access. Furthermore, these private areas are more likely to be damaged by riparian clearing, gravel mining and other undesirable land uses that degrade their trout habitat and reduce their ability to support trout populations. Missouri's limited trout habitat combined with heavy fishing pressure and continued stream degradation makes the acquisition of additional public land a top priority of future trout management efforts.

**Program Funding:** Traditionally, daily trout tags and trout permits have been sold to pay for the direct costs of trout production and stocking. However, costs will continue to increase and price increases will be necessary. Also, because trout permits are only a requirement for trout possession outside of trout parks, anglers who fish these areas without purchasing a trout permit do not contribute additional funds to program support.

Recently, non-governmental groups have provided financial contributions towards trout program expenditures, particularly land acquisitions along coldwater streams. These contributions have been used to demonstrate public support for such projects and have been used to justify larger expenditures of public funds. Such groups have also contributed labor and materials to a variety of habitat enhancement projects. Opportunities may exist to expand cooperative funding relationships.

**Diverse Fishing Regulations:** Because trout fishing is intensively-managed, the Wildlife Code has many regulations pertaining to trout fishing. Stream areas are managed independently and the regulations are tailored to fit the conditions of each fishery. Unfortunately, such an approach creates variations in the regulations among the types of trout fisheries (wild trout management areas, special trout management areas, etc.). Some anglers have questioned the need for the diversity of regulations and have challenged the need for existing restrictions, while others suggest that even more restrictions are necessary. Recently, anglers, representatives of businesses related to trout angling, biologists and law enforcement personnel have worked together to revise the definition of a "fly."

**Social Issues:** Because many trout waters are intensively-fished, conflicts among anglers or between anglers and other resource users are inevitable. Because of intense fishing pressure, prohibitions on the use of natural or prepared baits and soft plastic lures are often used to improve the survival of trout caught and released. If bait anglers are unwilling to alter their methods, they are displaced and may resent the exclusive use of these areas by anglers fishing with artificial lures or flies. Anglers may perceive some methods as unethical or environmentally

damaging, and demand prohibitions on activities such as the “San Juan” or “Taneycomo” shuffle where anglers intentionally disturb the bottom to dislodge invertebrates and stimulate trout to feed. Other anglers may object to the use of jet-powered boats in waters that are also wadeable. Giggling of non-game fish is a traditional Ozark activity still allowed in some trout management areas despite a long-term debate about its effects on trout and other gamefish. Trout angling rules that restrict giggling, or restrict tackle used for species other than trout, may limit access to trout-holding stream reaches by traditional anglers.

**Angler Recruitment:** Growth in fishing participation has not matched overall population growth in Missouri or elsewhere in the United States. While fishing is still practiced by about 23% of Missourians each year, there is a need to provide easily-accessible and productive fishing opportunities that will help recruit new anglers or renew interest in former anglers. Because of our ability to culture large numbers of trout to catchable sizes, stocked trout fisheries near population centers may be an effective way to provide introductory angling opportunities. Such fisheries can be established in easily-accessible impoundments in parks or on other public lands. Trout can provide a winter fishing opportunity that complements opportunities to catch warmwater fish in the same impoundments during warmer seasons. However, such efforts may not be as desirable if new anglers focus entirely on fishing our already crowded trout waters.

Angler recruitment could also be enhanced by providing special fishing events and opportunities for children. Each of the trout parks annually hosts at least one “kids fishing day” where a stretch of stream is restricted to children 15 years of age or less. At Maramec Spring Trout Park, this popular event attracts approximately 1,500 young anglers each year. Similar events could be held at other trout fishing areas.

**Population Increases:** Overall, Missouri’s population is expected to increase, which will likely create demand for water resources and result in changes in land use. Such changes could have important implications for spring recharge areas and the watersheds of Missouri’s trout streams. Fishing pressure could also increase.

**Natural Threats:** Trout populations have been dramatically affected by protracted wet or dry cycles during the 124-year history of salmonids in Missouri. Such dynamic cycles can dramatically alter the discharge and temperature of coldwater streams, physical habitat within streams and the survival, feeding, growth and reproduction of trout. Similarly, natural predators like otters, great blue herons, double crested cormorants, mink, kingfishers and common mergansers can prey on trout, but there are little data to determine what effects they may have on population density or size structure of trout populations. Furthermore, a variety of diseases can potentially afflict trout populations. Regulations to help prevent the spread and importation of salmonid diseases are in place, but require cooperation from anglers, agency personnel and commercial producers to be successful.

**Native Species Concerns:** Trout are not native to the Ozarks region. Throughout its history, the Department has been careful to avoid indiscriminate stocking of trout and this has likely reduced negative impacts on native aquatic species.

**Species/Strains/Genetics of Trout:** Many species and strains of salmonids have been introduced into Missouri since 1878. The rainbow trout strains currently residing in Missouri likely represent a wide range of the species’ genetic diversity. Additional research is needed to catalog this diversity and understand its management significance. Use of new strains of rainbow or brown trout, triploid trout or selectively-bred strains may all hold potential for improved management or diversified fisheries. However, multiple species, strains or races of trout complicate hatchery production and generally reduce production efficiency and capacity.

**Research Needs:** The Department strives to provide a diversity of trout angling experiences, but decisions on how to allocate the coldwater resource to various fishery types are sometimes made with inadequate information on habitat quality, trout population potential and angler interests. Department biologists and culturists have recognized these information gaps and have requested research to guide the allocation of habitat, hatchery trout and angling opportunities from a statewide perspective.

**Expanded Fishing Opportunities:** Despite the limitations and threats to trout fishing, several opportunities exist for expanding trout fishing opportunities. Enhancement of existing trout management areas could extend fishing success and maintain higher catch rates between stockings, or enhance survival of trout after stocking. Through land

acquisition, additional trout management areas could be established on streams that currently are not accessible to the public. Seasonal fisheries in urban lakes have become popular with anglers in the St. Louis and Kansas City metropolitan areas. With additional trout production or reallocation of existing production, similar fisheries could be established in other communities.

## **A Plan for Missouri Trout Fishing**

This plan provides a vision and an outline for how Missouri's trout program should be managed over the next decade. The plan includes goals and objectives that will shift the focus of Missouri's trout program in three very significant ways – we want more trout anglers to have successful fishing trips, we want to spread the harvest of trout out more equitably among all trout anglers, and we want to provide additional trout fishing opportunities for Missouri anglers. Many of these goals and objectives depend on the availability of funding, approval by the Department's Regulations Committee, and acceptance by potentially-affected interests.

This plan was written by a team of employees from the Department's Fisheries, Protection and Resource Science divisions, and then extensively reviewed. Three public focus group meetings were held in early 2003 to solicit review from anglers, agency partners and others interested in Missouri's trout program. A summary of comments received from this review process as well as a list of focus group participants are found in the Appendix. After all input was considered by an editorial team, the draft plan was reviewed again by staff from five Department divisions and the Director's office.

### ***Program Mission:***

Provide anglers with diverse, quality trout fishing opportunities consistent with overall sound management of our state's aquatic life.

**Goal 1:** Maintain quality trout fishing opportunities in the trout parks, Lake Taneycomo and the existing trout management, special trout management, wild trout management and urban winter trout management areas.

**Objective 1.1:** Refine our policy of managing fisheries based on habitat capability and social factors.

*Discussion:* The quality of trout habitat (biological, chemical and physical factors) determines the kind of trout population that a given area can support, while social factors such as angler access, proximity to highly-populated communities or other high use areas can determine what type of trout fishery is acceptable. The highest quality streams, with cold water temperatures and good habitat can be managed as sustainable trout fisheries capable of providing trophy trout. Lower quality habitat, while not suitable for wild trout, can be managed for "put-and-grow" fisheries where hatchery trout grow to larger sizes in the wild. Marginal or warmwater habitat may be capable of supporting put-and-take or seasonal fisheries where hatchery trout provide immediate opportunities for catch or harvest. Consideration of any of these management scenarios, however, must also include social factors. For example, managing for a wild trout stream adjacent to a trout park, with its emigration of stocked hatchery fish and high public use, may not be biologically or socially acceptable. In trout parks themselves, a long tradition of put-and-take management should be maintained for the foreseeable future even though they have high quality habitat that could support wild trout fisheries. Research is needed to inventory and assess trout habitat and social factors of Missouri streams so that the most appropriate management for each reach of stream can be identified.

**Objective 1.2:** Reduce the statewide daily limit on trout from 5 to 4 in the aggregate.

*Discussion:* Most trout harvest in Missouri occurs in trout parks, trout management areas, Lake Taneycomo and urban winter trout management areas. Reductions in the daily limit in these areas from 5 to 4 trout per day will distribute the harvest among more anglers. At the trout parks, the daily limit of four should improve angling success for many anglers. Lower daily limits already apply at special and wild trout management areas. Extending the daily limit reduction to all waters of the state will effect the remaining populations that do not exist in designated trout areas. Such populations are frequently small and often supported by natural reproduction and cannot support much harvest.

**Objective 1.3:** Provide enhanced year-round fishing success in trout management areas.

*Discussion:* Catch rates in trout management areas are dependent on the frequency of stocking. To stabilize trout densities and fishing success, managers should implement the following management changes:

- 1.) Spread available fish among more stocking trips; involve non-hatchery staff as needed to accommodate increased labor and transport requirements
- 2.) Stock in a manner that ensures adequate temporal and spatial distribution of trout and survival of stocked fish.
- 3.) Refrain from pre-announced stocking dates.
- 4.) Use brown trout for a portion of the rainbow trout allotment when surplus brown trout are available.
- 5.) Reduce the daily limit from 5 trout to 4 to match changes recommended for trout parks and distribute the harvest among more anglers.  
(Further changes are recommended in Objective 4.3).

**Objective 1.4:** Review management of all special trout management areas.

*Discussion:* Since 1974, six special trout management areas have been established. Brown trout is the primary species managed in these waters, and survival and growth after stocking vary considerably. Such variation may be attributable to differences in physical habitat, thermal quality, stocking densities, hooking mortality, illegal harvest or other factors. In response, managers will implement the following:

- 1.) Perform additional data collection to determine what factors affect survival and growth after stocking. Efforts to measure water temperature regimes and physical habitat are needed to evaluate current management.
- 2.) Spread available fish among more stocking trips; involve non-hatchery staff as needed to accommodate increased labor and transport requirements.
- 3.) Evaluate and make recommendations on increasing numbers and size of trout to be stocked in each area.
- 4.) Evaluate whether the boundaries of special management areas should be changed.
- 5.) Restrict tackle to artificial lures and flies only in special management areas and assess whether current regulations in these areas satisfy prevailing angling interests.

**Objective 1.5:** Review management of all wild trout management areas.

*Discussion:* Natural fluctuations in population size are to be expected in trout populations maintained through natural reproduction. Variations in reproductive rate, survival and growth will determine the number and size of trout in a population. Stocking in wild trout management areas will be restricted to populations that have been depressed beyond the point of natural recovery. Only wild strains of trout (based on genetic analysis) will be stocked. Wild trout management areas should only be maintained in small streams that can continuously sustain three or more year classes of wild, naturally-reproduced trout. Existing wild trout management areas should be periodically reviewed to determine whether they continue to provide high quality fisheries through natural reproduction. Specifically, the North Fork of the White and Eleven Point rivers, because these are larger streams that offer other management options, will be adequately stocked to ensure quality fishing opportunities.

Populations of wild trout will be larger and more stable in streams with good instream and riparian habitat. While research on trout habitat needs in Ozark streams is currently underway, a number of habitat enhancement techniques for small streams are already available to managers and could be used to improve wild trout populations.



**Objective 1.6:** Review, clarify and simplify trout fishing regulations.

*Discussion:* A group of Department Fisheries, Protection and Resource Science personnel, with input from trout anglers, will examine the current fishing regulations and make recommendations for any changes that are needed to ensure their effectiveness, consistency and clarity.

**Objective 1.7:** Evaluate trout areas for accessibility for a wide range of users.

*Discussion:* Trout areas managed by the Department of Conservation should be evaluated to determine if additional access development is necessary to accommodate wading, boating, bank angling and anglers with mobility impairments.

**Objective 1.8:** Conduct an angler survey focused on trout fishing and the trout program.

*Discussion:* Recent surveys of anglers fishing in Missouri trout parks have provided an excellent description of who these anglers are, and what is important to them. While occasional surveys have been conducted on a number of trout areas, a statewide survey of trout anglers has never been conducted. Such a survey would be a good way of reaching trout anglers and would provide important strategic information for the trout management program, and is proposed for fiscal year 2005.

**Goal 2:** Increase the number of trout available for stocking in coldwater streams and lakes.

**Objective 2.1:** Increase trout production at the Department's coldwater hatcheries by 20 percent.

*Discussion:* Opportunities for improving and securing trout production exist at all Department of Conservation hatcheries. Improvements could allow for a 10 percent emergency buffer within the system plus a 10 percent expansion to production capability that could be used for expanding the trout program. All of these potential improvements depend on funding availability and cooperation with our partners in the Department of Natural Resources, the James Foundation and the U. S. Army Corps of Engineers, and the ability to increase production while meeting existing and future water quality regulations. The Department plans to retain a consulting engineering firm with expertise in fish hatchery planning and design to evaluate the Department's trout hatcheries. The work is composed of three objectives: 1.) evaluate and make recommendations on increasing trout production in the Department's coldwater hatchery system by twenty percent with an emphasis on Shepherd of the Hills Hatchery, 2.) make recommendations on discharge water treatment and waste management (including fish cleaning stations) at all five hatchery facilities and 3.) produce a master plan for future development. Potential improvements and renovations may include:

*Shepherd of the Hills Hatchery:* This hatchery offers the greatest potential for increasing production. Potential improvements include:

- 1.) Renovation of the existing brown trout rearing facility to expand production of catchable rainbow and brown trout and expand space for broodstock.
- 2.) Repair or modify the existing water recirculation system. Currently, Shepherd of the Hills operates below the designed production capacity because the recirculation system is inefficient.
- 3.) Install an additional hatchery water supply line from Table Rock Dam's new emergency spillway. This could provide additional cold water to the hatchery for approximately 8 or 9 months of the year, could be used to elevate water temperatures and enhance trout growth rates, and could provide an emergency water supply in the event of blockage to the existing water supply line. Congressional approval would be required for any increase in total withdrawal from Table Rock Lake.

*Maramec Spring Hatchery:* Maramec Spring has an average discharge of approximately 144 cfs, but only about 11 cfs are used in the current raceway system. Additional raceway pools could be constructed to use more of the natural spring flow and rear additional trout for stocking. Trout from Maramec Spring would be infected with parasitic copepods and might have limited utility outside of the Meramec River drainage. However, the increased production would allow Maramec Spring to raise all fish needed for stocking Maramec Spring Branch, instead of supplementing stocking with fish reared at other Department hatcheries. This would effectively create space at other hatcheries that could be used to rear additional trout for stocking other waters.

*Montauk/Bennett Spring Hatchery Water Supplies:* During floods, warm, turbid water enters raceways at these hatcheries. Such conditions can cause trout mortality and create safety concerns for staff. A recirculation system at Montauk will be completed in fiscal year 2004 to isolate rearing pools during floods. In addition, alternative water supply technologies are being investigated at Bennett Spring and Montauk along with other hatchery renovations.

*Roaring River Hatchery:* Renovations at Roaring River hatchery that will secure water supplies and thereby maintain trout production are planned for fiscal years 2004 and 2005.

*Neosho National Fish Hatchery:* The Department has a long-standing and essential partnership with Neosho National Fish Hatchery, where a significant number of the trout needed to maintain the Missouri trout program are produced. Without this hatchery's production, any gains in Department production capabilities would be lost. The Department, and Missouri anglers, need to continue to show strong support for maintaining this facility.

In addition, new technologies, such as use of liquid oxygen systems, have the potential to enhance production within existing rearing space at all Department hatcheries.

**Objective 2.2:** Produce catchable-size rainbow trout that average 12.5 inches annually with a range of 10.0 to 14.0 inches and no more than 5% less than 10.0 inches.

*Discussion:* Missouri anglers have become accustomed to a large average size of trout stocked in put-and-take fisheries. Rainbow trout are often stocked at an average size of nearly 12 inches (with a range of 10 to 14 inches), making them some of the largest trout stocked by a state agency in the United States (Epifanio 2000). Large trout are expensive because they require more hatchery space, food and time to produce compared to smaller fish. Because our hatchery system is currently overloaded, it is sometimes necessary to reduce the size of trout stocked due to production limitations.

**Objective 2.3:** Continue to provide assistance to private fish culturists.

*Discussion:* Significant opportunities are available for trout fishing on private land, supported by privately-produced trout. Technical assistance from the Department of Conservation helps ensure that these trout are of good quality, able to support high quality fisheries, and will not introduce diseases, parasites or ecological challenges to publicly-managed trout fisheries. The Department provides assistance with fish pathology, hatchery design, maintenance suggestions and broodstock selection. By helping private hatcheries provide a reliable supply of high-quality trout, the Department will have an alternative source of trout for stocking public waters in the event that a significant loss of fish occurs at one or more public hatcheries.

**Objective 2.4:** Evaluate the role of private and cooperative trout production.

*Private Trout Production:* Opportunities may exist for private producers to supply trout which are certified disease free for Missouri's trout program at a competitive cost.

*Cooperative Trout Production:* Determine if privately-owned spring branches could be cooperatively-managed by groups or individuals for trout production. Department hatcheries could provide fingerling trout that would be subsequently grown large enough for release into nearby trout management areas. Development of such a program could be guided by experiences with similar programs in other states.

**Goal 3:** Increase the amount of coldwater habitat available for public trout fishing.

**Objective 3.1:** Acquire, by purchase or easement from willing sellers, public access to an additional 10 miles of coldwater streams by fiscal year 2008.

*Discussion:* Acquiring additional public ownership and access should be a high priority of Department trout management efforts. Our ability to acquire stream frontage will depend on commitment of staff time, property availability, financial resources and knowledge of resource quality. Furthermore, Department decision-makers must understand the need for additional coldwater stream areas so they will support such acquisitions. Land availability will be difficult to predict, but on average, about 1-2% of rural properties change ownership each year. Applying this percentage to the remaining miles of coldwater stream in private ownership, we can expect, on average, 1-2 miles of stream, statewide, to become available for purchase each year. Because these are average estimates, we can also expect long periods of time with no acquisition opportunities, while at other times, several properties may be available at the same time.

The Department will place a high priority on committing the financial resources necessary to acquiring these streams, as well as assisting other agencies and organizations who might also acquire property or assist the Department in acquisitions. Efforts by private conservation organizations to develop special accounts or fund-raising efforts to acquire more public ownership of coldwater streams should be encouraged, and the Department will assist in such efforts.

An assessment of trout habitat in Missouri would help establish acquisition priorities by identifying streams with the best habitat and the best potential for providing public trout fishing. Such an assessment should include existing trout areas as well as other coldwater streams with potential to provide public trout fisheries. Acquisition resources are likely to be limited, so it is important to purchase the best trout habitat that becomes available.

**Objective 3.2:** Implement a coldwater stream easement program.

*Discussion:* Opportunities to acquire coldwater stream easements should be pursued. Easements along riparian corridors ensure protection of the riparian habitat, provide public access, and give the department the right to enhance instream habitat and stock trout. Landowners receive payment for selling these rights to the department, but otherwise, retain ownership of the property. Costs of easements are determined by the length and width of the corridor and the appraised value of the property. Such a program has the potential to expand public access and management to a greater number of streams than acquisition alone and might be more attractive to some landowners than total sale of their property.

**Goal 4:** Enhance and diversify trout fishing opportunities.

**Objective 4.1:** Expand winter trout fishing opportunities to additional impoundments.

*Discussion:* Creation of new winter trout fisheries depends on increasing the production of trout by Department hatcheries, reallocating existing Department production or purchasing privately-produced trout.

Winter trout fishing opportunities are popular and have already been created in St. Louis and Kansas City area impoundments. Winter trout fisheries provide a readily-accessible fishing opportunity at a time of year when fishing for warmwater species is often poor. Winter trout fisheries also offer an opportunity to encourage fishing participation by new anglers.

To provide the greatest amount of fishing opportunity with a limited supply of trout, new winter trout fisheries should be managed with “delayed harvest” regulations and opportunities to incorporate these regulations into existing winter trout fisheries should be explored. With this approach, trout are stocked in the fall, protected by catch-and-release fishing regulations until late winter, and allowed to be harvested in the spring. During the catch-and-release period, fishing is restricted to flies and artificial lures to limit hooking mortality. Trout are “recycled” with this approach--total catch is typically 2-3 times the number of trout stocked and anglers eventually harvest most of the trout stocked. Compared to typical put-and-take fisheries, far fewer trout must be stocked in delayed harvest fisheries to sustain good catch rates over an extended period of time.

The Department will create new urban winter trout fisheries only in lakes covered by Community Assistance Program (CAP) agreements. Local municipalities or organizations must contribute at least 50% of the cost to purchase privately-produced trout. A winter trout program agreement will normally cover a three-year period to facilitate planning for trout production. The agreement will specify the responsibilities of all parties involved, in addition to outlining measures to protect Missouri’s trout populations from disease.

Additional guidelines to prioritize new fisheries and guide impoundment selection need to be developed before the program is expanded. Additionally, the name for these areas may need to be changed if fisheries in smaller communities are developed.

**Objective 4.2:** Increase emphasis on catch-and-release opportunities in the trout parks.

*Discussion:* Anglers have expressed a desire to have a catch-and-release daily tag to recognize and encourage the catch-and-release ethic and have requested catch-and-release areas at all trout parks.

- 1.) Pilot a catch-and-release daily tag at Bennett Spring Trout Park for the 2005 season.
- 2.) Consider establishing additional catch-and-release areas at the trout parks.

**Objective 4.3:** Pilot a winter catch-and-release season at one or more trout management areas.

*Discussion:* Trout management areas are regularly stocked with hatchery trout, primarily rainbows. Currently, most stocking occurs from February through October. Little stocking or fishing occurs during the winter months and, because most trout are removed soon after stocking ends, angling success is often poor. However, conditions for trout growth and survival are excellent at this time. By restricting all fishing to catch-and-release from November through February, the trout management areas could sustain higher densities of trout, higher angler catch rates, and some growth of trout on natural food during the winter season. Because these areas are not currently stocked or fished much during the winter, this change would affect few harvest-oriented anglers. To enhance survival of trout, all fishing during this catch-and-release season

should be restricted to flies and artificial lures and soft plastic, natural and scented baits should be prohibited. These rules would closely resemble the current catch-and-release season at the trout parks. Implementation of a catch-and-release season in the trout management areas could be done by re-scheduling some stockings to early November and would require no increases in hatchery production. Gear restrictions may not be popular in some waters that have important winter fisheries for other species.

**Objective 4.4:** Determine the feasibility of diversifying the size distribution of rainbow trout available for put-and-take stocking.

*Discussion:* As hatchery production capacity improves, the Department should determine the feasibility of producing a limited number of larger (e.g. 15-inch) rainbow trout available for put-and-take stocking. These fish should be distributed with normal stockings of catchable-size trout to create some diversity of size in the catch and the opportunity for anglers fishing outside of special trout management areas to occasionally catch a larger trout.

Another strategy for diversifying the size distribution of stocked rainbow trout would be wider distribution of excess broodstock throughout the trout management areas. Currently, most such fish are stocked in Lake Taneycomo or the trout parks. Distributing some of these trout to the trout management areas and urban winter trout management areas will provide anglers an opportunity to catch trophy-size rainbow trout in additional waters.

**Objective 4.5:** Create at least one new year-round trout area.

*Discussion:* Much of Missouri's coldwater habitat is already managed for public trout fishing. Management potential of the remaining streams is limited by small size, lack of public access or both. However, a few additional coldwater streams could support enough trout to provide public trout fishing if they were stocked or the wild trout in them were protected with harvest restrictions. Biologists should identify these stream reaches and create a priority list of areas which could be managed for public trout fishing. Future land acquisitions or public access easements may be necessary in some areas to create additional trout fishing opportunities.

**Objective 4.6:** Investigate the use of new strains or species of trout that may hold potential for improved management or diversified fisheries.

*Discussion:* Many species of salmonids have been introduced into Missouri since 1878. The rainbow trout is the only species that has established self-sustaining populations and has proven to be the easiest species to rear. Brown trout became a regular part of the trout program in 1974. Compared to rainbow trout, they have lower vulnerability to angling. Other species or strains of trout may have unique characteristics which could diversify and enhance trout angling.

Addition of new strains of trout to Missouri's trout program will require increased hatchery production space.

**Objective 4.7:** Minimize effects of new trout fisheries on cold water ecosystems.

*Discussion:* Springs and their branches give rise to cold water habitats that support an assemblage of native animals and plants different from other aquatic community types. Trout populations, maintained by natural reproduction or stocking, also occur in some of these cold water habitats. Although there is currently no indication that these trout populations negatively impact native aquatic species in Missouri, any potential impacts will be evaluated on a case by case and stream by stream basis.

Enhancing and diversifying trout fishing opportunities in Missouri presents a challenge for the Department's resource managers. Within the context of the trout plan, the goal of providing Missouri anglers with diverse, quality trout fishing opportunities dovetails with the Department's strategic goal of retaining public support and recruiting new participants. The challenge lies in striking a balance between the Commission's strategic goal to "preserve and restore the state's biodiversity," while simultaneously meeting the equally significant strategic goal to "retain public support and recruit new participants."

**Goal 5:** Enhance funding of the trout program.

**Objective 5.1:** Require a trout permit for fishing in designated trout waters.

*Discussion:* Since 1962, a trout permit or stamp has been required to possess trout outside of a trout park. A trout permit has never been required for simply fishing in an area managed for trout because native sport fish are usually present, occasionally in substantial enough numbers to attract anglers not fishing for trout. Such anglers may catch trout incidental to their pursuit of other species, and can simply release the trout if they do not have a trout permit. Furthermore, on some floatable streams, a day's fishing may include areas managed for trout and other areas where trout are not present.

However, fishing in some waters is so overwhelmingly dependent upon trout stocking that requiring a trout permit for fishing, not just possessing, seems justified. Anglers fishing an urban trout area in the winter, in upper Lake Taneycomo or one of the trout parks during the winter catch-and-release season are very unlikely to catch a native sport fish. Fishing success at these areas depends almost entirely on trout stocking, and most anglers select these areas because trout are present. Therefore, it is appropriate to ask such anglers to help pay for the costs of raising and stocking trout through the purchase of a trout permit. It is likely that we will increase the number of such areas in the future, so such a policy will become even more important.

**Objective 5.2:** Continually review the price of trout permits and daily trout tags for adults to raise the cost of permits as required to support quality trout fishing opportunities in Missouri.

*Discussion:* Normal inflationary pressures will increase costs of the trout program and require that we periodically examine the fee structure of trout tags and permits. Diversifying and enhancing trout fishing opportunities will require additional revenue and may result in increased cost to anglers for trout fishing.

**Objective 5.3:** Build partnerships with private conservation groups to help support the trout program.

*Discussion:* Private conservation groups have a history of providing advocacy, volunteer labor and financial resources to help protect and enhance trout fisheries in Missouri. Such groups have a vested interest in supporting the trout program and have proven to be motivated partners with the Department and other resource management agencies. Private contributions can enhance the Department's resources, permitting more land acquisitions, more capital improvements, additional habitat enhancements, etc. The Department should recognize the contributions of these groups and provide direction to their efforts to preserve, protect and enhance coldwater resources. Furthermore, the Department should participate in the implementation of the Missouri Trout and Coldwater Fund within the Missouri Conservation Heritage Foundation.

**Goal 6:** Provide special trout fishing opportunities designed to increase recruitment of new anglers.

**Objective 6.1:** Integrate Fisheries Division's strategic plan for angler recruitment into the trout program.

*Discussion:* A strategic plan to enhance Department of Conservation efforts to improve angler recruitment is being developed. When completed, this plan should be integrated into the trout program to insure coordination and enhance effectiveness of agency efforts. Where appropriate, private conservation groups may wish to become partners in recruiting new anglers.

**Objective 6.2:** Increase the number and improve the geographic distribution of impoundments managed for winter trout fishing.

*Discussion:* Winter trout fisheries provide easily-accessible, close-to-home, fishing opportunities for novice anglers. Increasing the availability of such fisheries will provide opportunities for new anglers to have successful fishing trips (see Objective 4.1). Furthermore, such impoundments also provide opportunities for the same anglers to fish for warmwater species at other times. Year-round management of such impoundments will sustain fishing opportunities and fishing interest of new anglers.

**Objective 6.3:** Create additional youth-only trout fishing opportunities at trout parks, trout management, urban winter trout management and other Department areas.

*Discussion:* Kids Fishing Days have become popular events at the four trout parks and a few trout management areas. Special opportunities have recently been established for young people to hunt deer, turkey and waterfowl in special weekend seasons that precede the general open seasons. Additional youth fishing opportunities exist in other areas of the trout program. For instance, a youth-only trout fishing event at the trout parks could be developed during the period between the end of the winter catch-and-release season and the March 1 opening day of the regular season. Similarly, the first weekend in November could be reserved for youth-only fishing in the urban winter trout management areas. Like the other youth-only seasons, these would provide an opportunity for adults to focus their efforts on teaching young anglers and provide an opportunity for youth to experience a successful trout fishing trip without competition from adults. This opportunity could be provided with little or no additional stocking required. Reduced daily limits could be implemented during these seasons to reduce harvest pressure and the need for stocking. However, youth-only events will increase management and enforcement costs, and might detract from the excitement of the traditional March 1 opening day in the trout parks. Youth-only events should be evaluated to determine if they bring more young anglers to trout fishing. Since the inception of the special "youth" daily trout tag in 1999, about 17-18% of the total tag sales have been to anglers age 15 years or younger (Table 9). Sales of "youth tags" should be monitored to see if the creation of youth-only events is associated with changes in sales of "youth tags" during the subsequent March 1 through October 31 season. Any such efforts must be coordinated with our partners (the Department of Natural Resources, the James Foundation, municipalities, etc.). Opportunities may exist to develop a catch-and-release pond fishery in conjunction with renovation of Shepherd of the Hills Hatchery.

**Objective 6.4:** Encourage special fishing opportunities for physically and developmentally-challenged anglers.

*Discussion:* Missouri trout areas provide excellent opportunities to enhance the quality of life for physically and developmentally-challenged citizens. Such anglers may find trout fishing to be a rewarding, life-long activity.

**Goal 7:** Improve communication with resource users and agency partners.

**Objective 7.1:** Maintain frequent contact with trout angling groups and agency partners.

*Discussion:* Regular contact with angling groups is essential for maintaining agency credibility and obtaining public consent and support for management activities (Behnke 1987). The Department should identify a trout plan coordinator who, along with Fisheries, Resource Science and Protection staff, will maintain regular contact with organized trout angling groups. In addition, regular contact should be maintained with agency partners regarding trout waters of mutual interest.

**Objective 7.2:** Provide information about trout fishing opportunities, trout management and regulation enforcement.

*Discussion:* The Department manages trout fisheries for the use and enjoyment of the public. Fishing opportunities created by this management should be made known to trout anglers and permit vendors through various print, electronic media, seminars and instructional materials. The Missouri Trout Map should be kept current with changes in the trout program. Trout fishing information should be available on the Department's website and inquiries about trout fishing that are received from the internet should be answered promptly. Staff should provide information and interviews to outdoor writers and other journalists that wish to promote Missouri trout fishing through newspapers, magazines, books, television, videos and radio. Protection Division will pilot a program of volunteers to assist with public education and information while providing an enhanced Department presence.

**Goal 8.** Provide substantial enforcement effort by Protection Division personnel on all managed trout waters.

**Objective 8.1:** Maintain frequent routine patrols of trout management areas, using both high profile and low profile patrol techniques. Trout regulation enforcement will be a special area of emphasis for Protection Division, and will be reflected in region and individual work plans in applicable parts of the state.

*Discussion:* Frequent patrols will maximize the benefits of strategies outlined in this plan, such as new regulations and increased trout stocking. Many participants in the focus group meetings strongly supported this objective.

**Objective 8.2:** Utilize personnel from other districts, regions, and divisions to assist with special patrols during high activity periods.

*Discussion:* Assistance will be needed to ensure the success of special patrols during high activity periods.



## **Summary**

Managing Missouri's coldwater habitat for a diversity of high-quality, sustainable fisheries is an important responsibility of the Missouri Department of Conservation. The Department has a long tradition of trout management, and a large trout program has developed and expanded over the years. While there are many opportunities for enhancing this program, there are also important constraints on coldwater resource availability, hatchery production and funds available for management. Fortunately, there are a number of improvements to the trout program that can be made at little additional cost, given current resources. Furthermore, the trout program provides excellent opportunities to enhance angler recruitment and create new advocates for resource management. Even more opportunities exist if additional funds can be directed towards hatchery improvements, resource acquisition and fishery research.

This plan includes goals and objectives that will focus Missouri's trout program on three priorities – we want more trout anglers to have successful fishing trips, we want to spread the harvest of trout out more equitably among all trout anglers, and we want to provide additional trout fishing opportunities for Missouri anglers. The plan will guide trout management through the next decade and inform our partners and constituents about the opportunities available and the challenges that we must address.

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Table 1. Daily trout tag sales at Missouri's trout parks for selected years between 1939 and 2001.

<b>Year</b>	<b>Bennett Spring</b>	<b>Maramec Spring</b>	<b>Montauk</b>	<b>Roaring River</b>	<b>Total</b>	<b>Tag Cost</b>
1939	12,689		3,040	11,470	27,199	\$0.25
1940	15,642		4,875	12,764	33,281	\$0.25
1950	26,396		17,946	27,446	71,788	\$0.50
1960	65,028	23,178	31,915	42,091	162,212	\$1.00
1970	138,266	62,515	90,549	78,544	369,874	\$1.25
1980	170,357	70,696	94,959	106,561	442,573	\$1.50
1990	167,587	84,294	90,045	105,665	447,591	\$2.00
1991	173,084	79,945	96,353	107,102	456,484	\$2.00
1992	173,796	73,781	97,319	109,539	454,435	\$2.00
1993	173,097	74,714	90,880	110,060	448,751	\$2.00
1994	187,096	74,286	97,419	122,779	481,580	\$2.00
1995	185,504	70,327	100,228	116,159	472,218	\$2.00
1996	179,744	65,000	95,219	115,049	455,012	\$2.00
1997	187,609	66,310	96,927	120,462	471,308	\$2.00
1998	186,364	61,392	93,879	122,216	463,851	\$2.00
1999	178,963	64,084	90,068	122,899	456,014	*
2000	181,366	61,919	89,778	118,314	451,377	*
2001	183,642	57,053	89,107	115,661	445,463	*

\* Starting in 1999 separate tags were issued for Youth (\$2.00) and Adults (\$3.00). For 1999 and subsequent years this table lists the combined total of Youth and Adult tags sold (see Table 9 for specific breakdown of tag sales).

Table 2. Trout permit sales in selected years from 1962 through 2001.

<b>Year</b>	<b>Number Sold</b>
1962	21,341
1970	62,055
1980	85,654
1989*	111,722*
1990	103,897
1995	107,150
1996	94,193
1997	96,136
1998	93,883
1999	95,555
2000	91,079
2001	90,320

\* Record year

Table 3. Missouri's trout parks.

<b>Water Body</b>	<b>County</b>	<b>Length of Management Area (miles)</b>	<b>Public Ownership (Miles)<sup>1</sup></b>	<b>Average Spring Discharge (cfs)</b>	<b>Typical Number of Rainbow Trout Stocked Per Year<sup>2</sup></b>
Bennett Spring	Dallas/ Laclede	1.5	1.5	150	410,000
Maramec	Phelps	0.7	0.0 <sup>3</sup>	144	140,000
Montauk	Dent	3.0	3.0	82	210,000
Roaring River	Barry	3.0	3.0	32	270,000

<sup>1</sup> The James Foundation owns Maramec Spring Trout Park, the others are owned by the Missouri Department of Natural Resources

<sup>2</sup> Trout are normally stocked at a rate of 2.25 per anticipated tag sold.

<sup>3</sup> Public access is granted with payment of a daily or annual fee

Table 4. Missouri's trout management areas.

<b>Water Body</b>	<b>County</b>	<b>Length of Management Area (miles)</b>	<b>Public Ownership (miles)</b>	<b>Land Owners<sup>1</sup></b>	<b>Species Present<sup>2</sup></b>	<b>Number/Species Stocked</b>	<b>Fishing Regulations<sup>3</sup></b>
Capps Creek	Barry/Newton	4.0	2.3	MDC, Jolly Mill Park Foundation, Private	RBT, BNT	4,000 RBT 1,000 BNT	Statewide <sup>3</sup>
Current River	Shannon	7.7	7.7	NPS, Public Fishing Easements	RBT, BNT	8,000 RBT	Statewide <sup>3</sup>
Eleven Point River	Oregon	14.2	14.2	USFS	RBT	16,000 RBT	Statewide <sup>3</sup>
Little Piney Creek	Phelps	3.7	3.3	USFS, Private	RBT	2,100 RBT	Statewide <sup>3</sup>
Roaring River	Barry	4.0	1.1	Private, MDC	RBT, BNT	4,000 RBT 500 BNT	Statewide <sup>3</sup>
Roubidoux Creek	Pulaski	0.9	0.5	City of Waynesville, Private, MDC	RBT, BNT	6,500 RBT	Statewide <sup>3</sup>
Stone Mill Spring	Phelps	0.3	0.3	USFS	RBT	3,900 RBT	As Posted <sup>4</sup>

<sup>1</sup> MDC=Missouri Department of Conservation, NPS=National Park Service, USFS=United States Forest Service

<sup>2</sup> RBT=Rainbow Trout, BNT=Brown Trout

<sup>3</sup> Daily limit of five trout, possession limit of ten trout, no size limits or gear restrictions, season open all year.

<sup>4</sup> Area regulations are currently under review. A permit may ultimately be required to access the spring branch through Fort Leonard Wood.

Table 5. Missouri's special trout management areas and Lake Taneycomo.

Water Body	County	Length of Management Area (miles)	Public Ownership (miles)	Land Owners <sup>1</sup>	Species Present <sup>2</sup>	Number/Species Stocked	Fishing Regulations <sup>3,4</sup>
Current River <i>(Montauk St. Park to Cedargrove)</i>	Dent, Texas, Shannon	9.0	9.0	NPS, Private with public fishing easements	BNT, RBT	8,000 BNT	15", 3 daily, AL/F only
Lake Taneycomo	Taney	22.7	1.8	Private, Empire District Electric Co., MDC, municipalities	RBT, BNT	750,000 RBT 10,000 BNT	See below <sup>5</sup>
Meramec River <i>(Highway 8 to Scott's Ford)</i>	Phelps, Crawford	8.2	3.0	MDC, Private, James Foundation	BNT, RBT	5,800 BNT	15", 3 daily, AL/F only
Niangua River <i>(Bennett Spring to Prosperine Access)</i>	Dallas, Laclede	11.5	2.8	Private, MDC, MDNR	BNT, RBT	5,000 BNT 7,500 RBT	BNT: 18", 1 daily RBT: Statewide
North Fork of the White River <i>(Blair Bridge to Norfork Lake)</i>	Ozark	7.6	1.6	Private, MDC	BNT, RBT	6,500 BNT	15", 3 daily
Roubidoux Creek <i>(Elevated utility crossing to Gasconade River)</i>	Pulaski	2.2	2.0	MDC, Private, City of Waynesville	BNT, RBT	800 BNT	15", 3 daily, AL/F only

<sup>1</sup> MDC=Missouri Department of Conservation, NPS=National Park Service, MDNR=Missouri Department of Natural Resources

<sup>2</sup> RBT=Rainbow Trout, BNT=Brown Trout

<sup>3</sup> Season open all year

<sup>4</sup> AL/F=Artificial lures and flies only

<sup>5</sup> In Lake Taneycomo upstream from the mouth of Fall Creek, all rainbow trout from 12 to 20 inches in length must be released, and fishing is restricted to artificial lures and flies only. There is a lakewide 20" minimum length limit on brown trout with a daily limit of 1 brown trout.

Table 6. Missouri's wild trout management areas.

<b>Water Body</b>	<b>County</b>	<b>Length of Management Area (Miles)</b>	<b>Public Ownership (Miles)</b>	<b>Land Ownership<sup>1</sup></b>	<b>Species Present<sup>2</sup></b>	<b>Number/Species Stocked</b>	<b>Fishing Regulations<sup>5</sup></b>
Barren Fork Creek <i>(Twin Spring to Sinking Creek)</i>	Shannon	3.2	1.2	Private, MDC	RBT	None	Catch and Release
Blue Springs Creek <i>(Blue Spring to Meramec River)</i>	Crawford	4.0	3.0	Private, MDC	RBT	None	18", 1 daily
Crane Creek <i>(upstream from Co. Rd. 13-195)</i>	Stone	8.0	3.5	Private, MDC	RBT	None	Catch and Release
Eleven Point River <i>(Greer Spring to Turner's Mill)</i>	Oregon	5.5	5.5	USFS	RBT	None <sup>3</sup>	18", 1 daily
Little Piney Creek <i>(Dent Co. line to Milldam Hollow Access)</i>	Phelps	9.9	1.8	Private, USFS	RBT	None <sup>3</sup>	18", 1 daily
Mill Creek <i>(Yelton Spring to Little Piney Creek)</i>	Phelps	7.7	4.6	Private, USFS	RBT	None	18", 1 daily
North Fork of the White River <i>(Upper outlet of Rainbow Spring to Blair Bridge)</i>	Ozark	5.9	0.0	Private	RBT, BNT	None <sup>4</sup>	18", 1 daily
Spring Creek <i>(Relfe Spring to Big Piney River)</i>	Phelps	6.2	4.9	USFS, Private	RBT	None	18", 1 daily

<sup>1</sup> USFS=United States Forest Service, MDC=Missouri Department of Conservation

<sup>2</sup> RBT=Rainbow Trout, BNT=Brown Trout

<sup>3</sup> Some hatchery rainbow trout migrate from the adjoining trout management area.

<sup>4</sup> Some hatchery brown trout migrate from the adjoining special trout management area.

<sup>5</sup> Fishing in all wild trout management areas is restricted to artificial lures and flies only. Soft plastic, natural and scented baits are specifically prohibited. There is no closed season.



Table 7. Missouri's urban winter trout management areas.

Lake	County	Acreage	Ownership	Number Stocked <sup>1</sup>	Fishing Regulations
<i>Kansas City Impoundments:</i>					
Alex George	Jackson	8.0	Jackson Co.	3000	Statewide <sup>2</sup>
Bowlin Road	Jackson	4.0	Jackson Co.	3000	Statewide <sup>2</sup>
Chaumiere Park	Clay	5.0	Kansas City	3000	Statewide <sup>2</sup>
Coot Lake on the James A. Reed Memorial Wildlife Area	Jackson	22.0	MDC	3000	Delayed Harvest <sup>3</sup>
<i>St. Louis Impoundments:</i>					
Busch 21	St. Louis	6.0	MDC	2400	Delayed Harvest <sup>4</sup>
Busch 22	St. Charles	4.1	MDC	3472	Statewide <sup>2</sup>
Busch 23	St. Charles	4.0	MDC	3472	Statewide <sup>2</sup>
Busch 24	St. Charles	3.1	MDC	2656	Statewide <sup>2</sup>
Busch 28	St. Louis	12.0	MDC	4800	Delayed Harvest <sup>4</sup>
Carondelet Park Boathouse	St. Louis	5.0	St. Louis City	3248	Statewide <sup>2</sup>
January-Wabash Park	St. Louis	5.0	City of Ferguson	3240	Statewide <sup>2</sup>
Jefferson	St. Louis	9.0	St. Louis City	3600	Delayed Harvest <sup>4</sup>
O'Fallon Park	St. Louis	5.3	St. Louis City	3440	Statewide <sup>2</sup>
Suson Park 1	St. Louis	1.5	St. Louis Co.	1048	Statewide <sup>2</sup>
Suson Park 2	St. Louis	3.0	St. Louis Co.	2104	Statewide <sup>2</sup>
Suson Park 3	St. Louis	3.5	St. Louis Co.	2448	Statewide <sup>2</sup>
Tilles Park	St. Louis	2.0	St. Louis Co.	700	Delayed Harvest <sup>4</sup>
Vlasis Park	St. Louis	0.5	City of Ballwin	400	Statewide <sup>2</sup>
Walker	St. Louis	2.0	City of Kirkwood	525	Delayed Harvest <sup>4</sup>
Wild Acres	St. Louis	2.5	City of Overland	500	Delayed Harvest <sup>4</sup>

<sup>1</sup> Primarily rainbow trout are stocked. Brown trout are stocked infrequently, when surplus hatchery production is available.

<sup>2</sup> Daily limit of 5 trout, possession limit of ten trout, no size limits or gear restrictions

<sup>3</sup> Daily limit of 5 trout, possession limit of ten trout except from November 1 through February 19 all trout must be released unharmed immediately after being caught, no gear restrictions except from November 1 through February 19 when only artificial lures and flies may be used.

<sup>4</sup> Daily limit of 5 trout, possession limit of ten trout except from November 1 through January 31 all trout must be released unharmed immediately after being caught, no gear restrictions except from November 1 through January 31 when only artificial lures and flies may be used.

Table 8. Characteristics of Missouri Department of Conservation trout production facilities.

<b>Facility</b>	<b>Water Supply Available (cfs)</b>	<b>Water Supply Needed (cfs)</b>	<b>Production Space in Raceways (ft<sup>3</sup>)</b>	<b>Typical Annual Production of Catchable Trout (No./Lbs)</b>
Bennett Spring	150	31	183,059	350,000/250,000
Maramec Spring	144	11	20,834	120,000/ 92,000
Montauk	82	31	97,400	380,000/290,000
Roaring River	32	19	29,114	190,000/146,000
Shepherd of the Hills	22	22	106,300 <sup>1</sup>	625,000/300,000

<sup>1</sup> Shepherd of the Hills also utilizes a pond containing 1.43 acre-feet of water

Table 9. Sales comparison of daily trout tags for youth and adults at Missouri's four trout parks, 1999-2001.

TAG TYPE	YEAR		
	1999	2000	2001
<b>DAILY ADULT TROUT TAGS (\$3)</b>			
Bennett Spring	150,528	152,024	155,522
Maramec Spring	53,592	51,761	47,868
Montauk	75,280	74,723	74,081
Roaring River	95,465	92,272	90,100
Total Daily Adult Trout Tags	374,865	370,780	367,571
<b>DAILY YOUTH TROUT TAGS (\$2)</b>			
Bennett Spring	28,435	29,342	28,120
Maramec Spring	10,492	10,158	9,185
Montauk	14,788	15,055	15,026
Roaring River	27,434	26,042	25,651
Total Daily Youth Trout Tags	81,149	80,597	77,892
<b>TOTAL DAILY TAGS SOLD</b>	456,014	451,377	445,463

## Appendix

### Summary of review by the public, agency partners and others interested in the trout plan.

*Goal 1. Maintain quality trout fishing opportunities in trout parks, Lake Taneycomo, and the existing trout management, special trout management, wild trout management and urban winter trout management areas.*

*Objectives:*

1.) *Refine our policy of managing fisheries based on habitat capability and social factors.*

**There were few comments on this objective.**

2.) *Reduce the statewide daily limit from 5 to 4 in the aggregate.*

**In general, anglers supported this proposal, but many, wide-ranging comments were received. Examples include:**

- **Make the limit even lower (i.e. 2 or 3 per day)**
- **A lower limit should have been adopted long ago.**
- **A lower limit sends a conservation message to anglers.**
- **Reducing the limit will make it easier for harvest-oriented anglers to achieve their goal of “catching a limit.”**
- **A daily limit reduction is a good idea if stocking rates are unchanged.**
- **Should we keep the daily limit at 5 and concentrate on stocking more trout?**
- **A survey of anglers is needed before reducing the limit**
- **Does a lower daily limit really help distribute the harvest among that many more anglers?**
- **A lower daily limit may reduce angling participation, particularly from harvest-oriented anglers.**

3.) *Provide enhanced year-round fishing success in trout management areas.*

**There were few comments on this objective, but those who did comment generally supported the proposals. There was some disagreement from those who favor pre-announced stocking dates as a way to give all anglers equal access to recently-stocked trout.**

4.) *Review management of all special trout management areas.*

**Most anglers support the concept of special trout management areas and favor more restrictions in these fisheries. Suggestions included higher length limits, lower daily creel limits, catch and release regulations and more restrictions prohibiting the use of natural and scented baits where they are currently legal.**

5.) *Review management of all wild trout management areas.*

**Most anglers support the concept of managing some waters for wild, naturally-reproduced trout. However, there is frustration that a few existing wild trout management areas are not producing enough trout to sustain a quality fishery. In these areas, anglers suggested some kind of stocking program or conversion to Special Trout Management areas. Anglers also support habitat improvement efforts for Wild Trout Management areas.**

6.) *Review, clarify and simplify trout fishing regulations.*

**Most anglers appreciate efforts to keep regulations as simple and clear as possible. However, they often commented that regulation signs are often too small, insufficient in number, include too much text and are ignored by too many anglers. Support for additional enforcement was widespread.**

7.) *Evaluate trout areas for accessibility for a wide range of users.*

**We received few comments on this objective. Anglers were in favor of making more accesses ADA accessible, and some favored reserving a small area around such accesses for disabled anglers only.**

8.) *Conduct an angler survey focused on trout fishing and the trout program.*

**Anglers supported a comprehensive survey of anglers fishing for trout in Missouri and suggested that the survey include a cross section of anglers and trout areas.**

*Goal 2. Increase the number of trout available for stocking in coldwater streams and lakes.*

*Objectives:*

1.) *Increase trout production at the Department's coldwater hatcheries by 20 percent.*

**This objective received widespread support from anglers and generated much discussion and a number of suggestions. Anglers supported the expansion and/or improvement of existing Department hatcheries. In addition, private fish culturists suggested that they have the capacity to supply trout that MDC could purchase for stocking. Anglers and culturists suggested a number of other options including purchasing additional springs or private hatcheries and utilizing liquid oxygen systems to increase production. It was suggested that the quality of trout produced should not be lowered in an attempt to increase the quantity available for stocking.**

2.) *Produce catchable-size rainbow trout that average no more than 12.5 inches annually with a range of 10.0 to 14.0 inches and no more than 5% less than 10.0 inches.*

**Most anglers enjoy the large average size of Missouri's catchable trout and understand that they are larger than fish stocked in many other states. While most understood the need to limit the average size of trout to no more than 12.5 inches, several anglers requested that the minimum size stocked should be 10.0 inches and trout should be closely graded before stocking to prevent the release of smaller fish.**

3.) *Continue to provide assistance to private fish culturists.*

**Private fish culturists supported this objective and commented that fish pathology services provided by MDC are important to them.**

4.) *Evaluate the role of private and cooperative trout production.*

**This objective was added as a result of public comment and subsequent discussions.**

*Goal 3. Increase the amount of coldwater habitat available for public trout fishing.*

*Objectives:*

- 1.) *Acquire, by purchase or easement, public access to an additional 10 miles of coldwater streams by fiscal year 2008).*

**There was strong support for this objective among anglers and agency cooperators.**

- 2.) *Implement a coldwater stream easement program.*

**There was also strong support for developing/expanding this approach to providing more public trout fishing opportunities.**

*Goal 4. Enhance and diversify trout fishing opportunities.*

*Objectives:*

- 1.) *Expand winter trout fishing opportunities in additional impoundments.*

**In general, anglers supported expansion of the urban winter trout program but offered a number of suggestions for improvement including:**

- **Establish “kids only” fishing opportunities**
- **Require a special permit for fishing urban winter trout areas**
- **Increased enforcement of regulations**
- **More education of urban trout anglers**
- **Utilize privately-produced trout for program expansion**
- **Develop a way of quickly establishing delayed-harvest regulations for new winter trout fisheries.**

**A few anglers commented negatively about the artificial nature of these fisheries. Anglers that preferred stream fishing said they did not like fishing in an urban impoundment. Some anglers expressed concern that winter trout expansion should not divert trout away from other trout areas.**

- 2.) *Increase emphasis on catch-and-release opportunities in the trout parks.*

**(Note: as presented at the focus groups, this objective called for a “catch-and-release Wednesday” at one park). There was general support for increased catch-and-release opportunities at the trout parks, but some concern that a specific day of catch-and-release could reduce angler participation. There was more support for designated catch-and-release areas at each park. There was also interest in providing the option for anglers to buy a catch-and-release daily tag that would permit them to fish, but not harvest. Several anglers also requested that the winter catch-and-release fishing season be expanded to include more days of the week.**

- 3.) *Pilot a winter catch-and-release season at one or more trout management areas (p. 13).*

**Anglers liked the idea of expanding the concept of a winter catch-and-release season to trout management areas. Some questioned whether existing Trout Management Areas should have seasonal, or year-round, restrictions on harvest if they can support trout year-round.**

- 4.) *Determine the feasibility of diversifying the size distribution of rainbow trout available for put-and-take stocking (p. 14).*

**There was little comment on this objective, although responses to objective 2.2 indicate that anglers support the stocking of large trout.**

- 5.) Create at least one new year-round trout area.

**Anglers support expansion of the trout program to additional waters and offered suggestions for areas that might be suitable. Agency partners, however, indicated concern for the possible effects of trout introductions on native aquatic life.**

- 6.) Investigate the use of new strains or species of trout that may hold potential for improved management or diversified fisheries.

**After additional explanation, anglers generally supported this objective. Several suggested that the Department consider adding new species of trout to the program.**

- 7.) *Minimize effects of new trout fisheries on cold water ecosystems.*

**Agency partners were concerned about the effects of trout introductions on native aquatic life.**

*Goal 5. Enhance funding of the trout program.*

*Objectives:*

- 1.) *Require a trout permit for fishing in designated trout waters.*

**Anglers supported this objective and many anglers supported the idea of expanding the trout permit as a requirement for all fishing in a trout area.**

- 2.) *Continually review the price of trout permits and daily trout tags for adults to raise the cost of permits as required to support quality trout fishing opportunities in Missouri.*

**Many anglers commented that trout permit and daily tag fees seem low, “that quality recreation time is expensive,” and that the fees could be raised to generate income to maintain or improve the quality of trout fishing.**

- 3.) *Build partnerships with private conservation groups to help support the trout program.*

**There were no comments received on this objective.**

*Goal 6. Provide special trout fishing opportunities designed to increase recruitment of new anglers.*

*Objectives:*

- 1.) *Integrate Fisheries Division’s strategic plan for angler recruitment into the trout program.*

**Most comments suggested that angler recruitment efforts should be focused on youth. While the majority of anglers supported this objective, a few questioned whether angler recruitment was a valid role for the Department of Conservation.**

- 2.) *Increase the number and improve the geographic distribution of impoundments managed for winter trout fishing.*

**There was little comment on this objective, but comments to objective 4.1 suggest that most anglers support this idea.**

- 3.) *Create additional youth-only fishing opportunities at trout parks, trout management, urban winter trout management and other Department areas.*

**Many anglers supported this objective and organized trout angling groups offered to assist with Kids Fishing Days at the trout parks.**

- 4.) *Encourage special fishing opportunities for physically and developmentally-challenged anglers.*

**A few supportive comments were received for this objective.**

*Goal 7. Improve communication with resource users and agency partners.*

*Objectives:*

- 1.) *Maintain frequent contact with trout angling groups and agency partners.*

**Angling groups are interested in participating in trout management and providing volunteers to assist with special projects. They supported the concept of a trout plan coordinator to oversee implementation of the trout plan.**

- 2.) *Provide information about trout fishing opportunities, trout management and regulation enforcement.*

**This objective received support because it helps educate anglers, retailers and the general public about the trout program.**

*Goal 8. Provide substantial enforcement effort by Protection Division personnel on all managed trout waters.*

*Objectives:*

- 1.) *Maintain frequent routine patrols of trout management areas, using both high profile and low profile patrol techniques. Trout regulation enforcement will be a special area of emphasis for Protection Division, and will be reflected in region and individual work plans in applicable parts of the state.*

- 2.) *Utilize personnel from other districts, regions, and divisions to assist with special patrols during high activity periods.*

This goal and the related objectives were not included in the draft version of the trout plan presented at the three public focus group meetings, however strong support for enforcement efforts was expressed at each meeting.