DAILEY LAKE

MANAGEMENT PLAN

1991-1995

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with assistance from:

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INTRODUCTION

Dailey Lake is a popular recreation spot for people in the upper Yellowstone River valley and has become increasingly popular for people from the broader region extending from Bozeman to Billings. Dailey Lake represents a limited resource in that it is one of the few larger (204 acres) low elevation lakes in the region open to public access. The lake has historically provided anglers with an opportunity to catch rainbow trout, kokanee salmon, and yellow perch in a lake environment. Use of Dailey lake by water-based recreational users such as wind surfers, water skiers, and, more recently, jet skiers has increased dramatically during recent years.

Shepard (1991 and 1993) described the history of the sport fishery in Dailey Lake and presented summaries of data collected from 1989 to 1992. A brief history of the sport fishery from Shepard (1991) follows.

Dailey Lake was managed by the Montana Department of Fish, Wildlife and Parks (MDFWP) as a mixed rainbow trout and yellow perch fishery from 1951 to the late 1970's. Yellow perch were believed first introduced in 1944 (Johnson 1965). The lake's yellow perch population has gone through periodic cycles of increases to extremely high densities followed by population crashes. Population crashes were believed to be caused primarily by disease related mortality, but no agent could be identified (MDFWP files). During periods of high yellow perch populations, growth of yellow perch was slow, leading to a stunted perch population. Rainbow trout growth and survival also suffered when perch populations were high (Clancy 1985 and 1987). Anglers expressed dissatisfaction when yellow perch populations were high because of smaller average sizes for both perch and rainbow trout. To limit yellow perch populations the lake was intermittently treated with rotenone from 1977 to 1984 (Clancy 1985). The effectiveness of rotenone treatment was variable depending on wind conditions. When the treatment was effective in reducing perch populations, a subsequent increase in growth rates for both perch and trout was observed (Clancy 1985).

In the late 1970's MDFWP began soliciting public comments on using walleye as a means to control the yellow perch population in Dailey Lake (MDFWP files). An obvious spinoff benefit was to provide a walleye fishery, but the primary objective was to control the perch population (MDFWP files). After several public meetings MDFWP decided to introduce walleye into Dailey Lake to assess their ability to control the perch population and provide a fishery.

By the mid-1980's MDFWP concluded that annual walleye plants experienced variable survival and were not effectively controlling perch populations (Clancy 1987). One reason for the variable survival of planted walleye was that walleye fry were planted. It was speculated that yellow perch were preying heavily on released walleye fry. Even with variable survival, enough walleye survived to maintain a small walleye population in the lake. However, when the yellow perch population again built to high levels in the mid-1980's, MDFWP decided to treat the lake with rotenone to reduce perch numbers (Clancy 1985). That treatment was done in 1984 with moderate success.

In 1987 MDFWP prepared a Montana Warm Water Fish Management Plan. Under that plan the objectives for warm (cool) water fish in Dailey Lake were to provide for an opportunity to catch perch at least 7 inches in length and walleye up to 18 inches in length. It was also recommended to periodically treat the lake with rotenone if perch populations built to levels which caused stunting. The problem with periodic rotenone treatments was that under that type of management a walleye fishery could not be maintained. Walleye are particularly sensitive to rotenone and using periodic rotenone treatment to reduce yellow perch populations precludes the development of a walleye fishery which requires that walleye survive in the lake over five years.

The Dailey Lake Fisheries Management Steering Group (SG) was formed in 1990 and a draft management strategy for evaluating the success of providing a mixed walleye, rainbow trout, yellow perch fishery was developed. The SG agreed to begin stocking and evaluating the performance of two wild strains of rainbow trout, the Eagle Lake and Desmet, to replace the domesticated Arlee strain of rainbow trout which was the strain primarily stocked in the past. The SG agreed that periodic rotenone treatment of Dailey Lake to control perch populations was not a viable management tool in order to maintain a walleye fishery. The SG agreed to an annual fish planting schedule and established tentative goal catch rates and average lengths for each species (Tables 1 and 2). It was understood by the SG that all the goals for each species may not be attainable. The SG recognized the need for an intensive creel census and angler opinion survey to document the existing angler use and clientele using the lake. This report presents a five year management plan (1991-1995) for Dailey Lake which was agreed will be a pilot management plan to evaluate the three species fishery (rainbow trout, walleye, and yellow perch).

Table 1. Dailey Lake goal catch rates, average lengths of angler caught fish, and proportions of sampled fish populations over a given size for walleye, rainbow trout, and yellow perch agreed upon by the Dailey Lake Fisheries Management Steering Group on November 27, 1990. "Walleye" and "rainbow catchers" in parentheses indicate catch rates for those anglers catching walleye and rainbow, respectively.

	Angler catch		Gill net sample
Species	Fish/hr.	Average length	Percentage of fish over a given length
Walleye	0.05 0.5-0.8 (walleye catchers)	> 14.5 inches	10% > 16.0 inches
Rainbow trout	0.10 0.80 (rainbow catchers)	> 14.0 inches	20% > 16.0 inches 10% > 18.0 inches
Yellow perch	1.50	> 7.0 inches	10% > 9.0 inches

Table 2. Stocking rates recommended by the Dailey Lake Fisheries Management Steering Group for walleye and rainbow trout into Dailey Lake from 1991 through 1994.

Year	Species (Strain)	Number	Comments
1991	Rainbow (Eagle Lake)	10,000	
	Rainbow (Desmet)	2,000	Overwintered
	Walleye	15,000	Fingerlings
		?	Number from Fish Tech
1992	Rainbow (Eagle Lake)	5,000	Adjusted depending on growth and survival of 91 plant of rainbow
	Rainbow (Desmet)	2,000	Overwintered
	Walleye	15,000	Fingerlings
		?	Number from Fish Tech
1993	Rainbow (Eagle Lake)	5,000	Adjusted depending on growth and survival of 91 and 92 plants of rainbow. Continuation of Desmet plants will depend on a much higher survival of Desmet versus Eagle Lake.
	Walleye	7,000	May be adjusted depending on growth and survival of 91 and 92 plants and perch population levels
1994	Rainbow (Eagle Lake)	5-10,000	Adjusted depending on growth and survival of 91, 92, and 93 plants of rainbow.
	Walleye	7,000	May be adjusted depending on growth and survival of 91 and 92 plants and perch population levels

MANAGEMENT STRATEGIES

FISH STOCKING

The SG, based on a recommendation by MDFWP, recommended replacing the existing domesticated strain of rainbow trout (Arlee) with wild strains. The two wild strains readily available are Eagle Lake and Desmet. Both strains have been successfully stocked into Dailey Lake since 1991. The SG agreed to another test plant of Arlee to determine relative angler catchability between the three strains. Therefore, in 1993 5,000 each of Arlee, Eagle Lake, and Desmet strains were released into Dailey Lake. The Eagle Lake and Desmet strains were batch marked. The creel census in 1994/95 will assess the relative catchability between these three strains. The over-wintered Desmet rainbow trout (6-7 inch) cost almost twice as much as the 4-5 inch Arlee and Eagle Lake (Table 3). The relative survival between these three strains should be assessed to determine if the Desmet strain survives twice as well as the Eagle Lake strain. If not, the Eagle Lake strain would be more cost effective to use. Growth information (Shepard 1993) indicates that these two strains grow at about the same rate.

Table 3. Cost per fish by size for walleye and rainbow trout released into Dailey Lake. Costs include egg collection, rearing, and distribution costs.

Species	Size (in)	Cost per fish ($ in 1992)	Comments
Walleye	2	0.376	Fingerlings released in June
	4	1.236	Fed fingerlings released in August/September
Rainbow			
Arlee	4-5	0.148	Early spring release
Eagle Lake	4-5	0.148	Early to mid- summer release
DeSmet	6-7	0.236	Over-wintered and released in spring or early summer

Walleye from the Fish Technology Center should be available through 1998, but will not be available over the long-term. Walleye from the Fish Technology Center will not be available in

1993. Cost estimates for production of various size walleye indicate that the late summer walleye fingerlings cost almost four times as much as the early fingerling releases (Table 3). If the late summer walleye do not survive at least four times as well as the early summer fingerling releases, it would be more cost effective to release all walleye as early summer fingerlings. However, even if late summer fingerling releases do not survive four times better than early summer releases, it may be worth continuing to make some late summer fingerling releases to spread potential risk of a year class failure due to environmental causes.

Stocking success of individual groups of fish for both rainbow and walleye may be related to water temperature, food availability, and predation. These relationships should be assessed.

FISH SAMPLING

Spring gill netting will continue to be the primary tool for estimating relative abundance and growth of walleye, yellow perch, and trout. The gill net data should be augmented with trap net and electrofishing data, especially for yellow perch and rainbow trout, respectively. It would be worthwhile to conduct at least one, and possibly more, July gill net samplings to develop a better relationship between spring and summer gill net catches so that summer gill net data collected prior to 1990 can be compared to spring gill net data collected after 1989.

Spring and fall shoreline electrofishing estimates for rainbow trout should be continued until at least 1994. At that time this method should be re-evaluated considering the reliability of estimates and relative trade-off for potential harm to spawners. Consideration should be given to counting redds by snorkeling.

Beach seine sampling should be done during summer to assess annual perch recruitment and relative abundance of stickleback.

Walleye and rainbow trout reproduction needs to be monitored. No mature adult walleye have been sampled to date. The timing and location of both rainbow trout and walleye spawning needs to be better documented. If reproduction occurs, are any naturally produced fry recruited to fishery? The spawning enhancement project at the south end of the lake (see below) needs to be monitored to determine if either rainbow trout or walleye use these two spring channels.

Fish captured by anglers need to be sampled to augment growth information and provide relative catchability information for the various rainbow trout strains and assess the vulnerability of walleye.

ANGLER USE AND HARVEST

Weekend/holiday creel censuses should be conducted in 1993. Pressure and harvest estimates from these weekend/holiday creels are known to be potentially biased, but these surveys provide relatively good catch rate information. Past experience has shown that half the weekend/holiday days must be sampled to provide reliable pressure and harvest results. Winter harvest may be significant and winter surveys should be incorporated into future creel sampling efforts.

A complete creel census needs to be done in 1994/95 for comparison against the 1990/91 creel results to indicate the success of the present management strategy. This 1994 creel census should incorporate a spring through fall creel similar to that done in 1990 along with a winter period creel during 1994/95. A car counter site utilized by the Parks Division for assessing total use of Dailey Lake should be monitored during the 1994/95 creel to determine if a reasonable relationship exists between car counts and angler pressure. The feasibility of incorporating data from an Omnidata air and water temperature monitor and a recording "Windtalker" wind meter, currently maintained by the Big Sky Wind Surfers, should be considered for use in developing a pressure-car count relationship related to weather conditions.

OTHER RECREATION USE

While conducting creel censuses, other recreational users of Dailey Lake should be counted to determine the relative use by various user groups. It may be worthwhile to repeat the interviews of other recreational users done in 1990 to estimate use pressure in 1994 and compare this use with that observed in 1990. The use of weather and car count data (suggested above) could also be applied to estimate pressure from these other recreational users. Observations on conflicts between users should be kept and reported.

HABITAT ENHANCEMENT

An on-going project to enhance spawning within the springs entering from the south end of the lake should be completed by 1995. This enhancement should include opening a channel through the bull rushes at the south end of the lake so fish can access the spring channel to the southwest side of the lake. (Note: This was accomplished in February 1993.) The western spring channel should be cleaned of debris by hand during the summer of 1993 and locations for spawning riffles, holding pools, and portions of the

creek where heavy equipment is needed for cleaning should be clearly flagged. During the winter of 1993/94 the western channel should be cleaned by backhoe, holding pools should be excavated, and gravel placed in spawning riffles. Gravel should be placed to a depth of at least six inches over at least four square feet at each spawning riffle with an emphasis on providing as much useable gravel area as possible.

Access to the eastern spring should be excavated by hand during the summer of 1993 by digging small jump pools to allow fish to enter the main spring pool. The southwestern portion of the pool where spring water enters the pool should be clearly flagged so that spawning gravels can placed during the winter of 1993/94 by backhoe. At least eight square feet of spawning gravel to a depth of at least six inches should be placed.

Some interest has been expressed by walleye and perch anglers to place some type of structure in the lake. A thorough literature review on structure enhancement should be done. Based on that review, recommendations should be presented to the SG and a plan of enhancement developed. Funds for this project should be obtained from the local angling organizations.

WATER MANAGEMENT

Management of the lake's water surface elevation will continue to be an important component for providing a quality fishery and recreation experience. The Sixmile to Dailey Lake ditch must be annually maintained. The informal agreement with the Buffalo Jump partnership on water sharing of Sixmile water in exchange for minimum water elevations in Dailey Lake needs to be re-evaluated and formalized, if possible.

The relationships between water yield forecasts by the SCS, Dailey Lake water elevations, the rate of inflow from the Sixmile ditch, and rate of filling of Dailey Lake need to be better quantified. The merits of replacing a portion of the past year's water in Dailey Lake with fresh water from the current year by drawing Dailey Lake down in the early spring of each year need to be further evaluated and management strategies to accomplish the optimum water replacement should be developed.

SITE DEVELOPMENT

The recreation site development scheduled for 1993 needs to be monitored. This phase of the development was designed using results from questionnaire results, public meetings, contact with

user groups, and Steering Committee. Shepard (1993) summarized results of the questionnaire which ranked the types of facilities users of Dailey Lake wanted to see. Subsequent meetings and public contacts indicated that the additional boat ramp, access to the shore by wind surfers, camping areas, a path and fishing station for people who have difficulty walking the shoreline, a boat dock, better toilet facilities, and picnic tables were all more important to those attending the meetings than having potable water on the site.

Several user groups and clubs (specifically the Joe Brooks Chapter of Trout Unlimited, Yellowstone Fly Fishers, Upper Yellowstone Chapter of Walleye Unlimited, and the Big Sky Windsurfers) volunteered to assist in constructing picnic shelters and maintaining trees. It was agreed that these groups would construct these shelters using plans provided by MDFWP to ensure that all the shelters were uniform. The Joe Brooks Chapter of Trout Unlimited and Upper Yellowstone Chapter of Walleye Unlimited both agreed to donate money to construct two signs, one to be placed at each boat ramp, describing the species of fish in Dailey Lake and recommending that anglers release trout and walleye under 12 inches. Preliminary designs for these signs have been submitted to the SG for review.

GOALS

The angling goals for Dailey Lake as agreed to by the SG are clearly presented in Table 1. These goals may need some modification, particularly in terms of goal catch rates for rainbow trout and walleye, but monitoring of these parameters will serve to evaluate the management strategies applied to the Dailey Lake fisheries. Goals may need to be developed for other recreation users and site development.