

**Comprehensive Study of the Salt River Fishery Between Afton and Palisades  
Reservoir from 1995-1999 with Historical Review; Fur Trade-1998**

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**by**

**Kevin R. Gelwicks  
David J. Zafft  
Rob D. Gipson  
Tracy J. Stephens**

**Wyoming Game and Fish Department  
Fish Division  
5400 Bishop Blvd.  
Cheyenne, WY 82006**

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## **Executive Summary**

The Salt River drainage is in western Wyoming and eastern Idaho, bordered by the Salt River Range (east), Gannett Hills (south) and the Caribou and Webster Ranges (west). The mainstem Salt River, a fifth order stream, arises in southern Salt River Range and flows about 72 mi to Palisades Reservoir. Along most of its course, the river meanders through the 35-mi long by 4-mi wide Star Valley. Sport fish in the drainage are native Snake River cutthroat trout *Oncorhynchus clarki* spp. (SRC) and mountain whitefish *Prosopium williamsoni* (MWF), brown trout *Salmo trutta* (BNT) and more limited populations of brook trout *Salvelinus fontinalis* (BKT) and rainbow trout *Oncorhynchus mykiss* (RBT).

Trappers frequented the Star Valley in the early 1800s in search of beaver, bison and salt. Later that century, emigrants traveling on the Lander cutoff of the Oregon Trail passed through the Upper Valley. Settlement began in the late 1800s and the valley developed into the agricultural community that exists today. Early fishery management consisted of stocking BNT, RBT, BKT and SRC, studying the interactions between MWF and trout and removing MWF to alleviate competition with trout. In the early 1970s, management priority on the Salt River shifted to habitat protection and maintenance. From the early 1970s through the mid-1990s, the Wyoming Game and Fish Department (WGFD) worked with other state and federal agencies, local hunting and fishing clubs and private landowners to stabilize streambanks on the downstream 40 mi of river.

Local anglers have always been interested in management of the Salt River fishery. Organizations such as the Star Valley Wildlife Club, and more recently the Star Valley Chapter of Trout Unlimited, have been actively involved in management of the Salt River fishery. From the early 1960s to the present, local anglers and members of these organizations periodically expressed concerns that the quality of fishing on the Salt River was declining. Many felt that degradation had made the river unsuitable for native SRC and called for heavy stocking of BNT and RBT. Local fish biologists resisted continuing to stock only native SRC. Local anglers were also instrumental in changing fishing regulations on the Salt River, including lifting the winter closure on the downstream part of the river (1978) and imposing a slot regulation and tackle restriction on the middle (Narrows) section of the river (1989).

By the early 1990s, local angler interest remained high, a hydroelectric power plant was proposed for the lower river and water diversions were affecting stream flows and fish movements throughout the drainage. In addition, the conversion of agricultural lands to residential and commercial properties began in the valley. The WGFD needed more information to make informed fishery management decisions in the Salt River drainage. In 1995, the WGFD and the Wyoming Cooperative Fish and Wildlife Research Unit (Coop Unit) began a major fishery investigation on the Salt River with the main purpose of providing updated information on all aspects of the Salt River fishery for future management decisions. Coop Unit responsibility was to determine distribution and abundance of sport fish in Salt River tributaries. Personnel from the WGFD's Fish Population Unit (FPU) and Jackson Regional Fisheries Management (FMJN) set out to describe the population dynamics of wild and hatchery trout in the Salt River and characterize post-stocking and spawning movements in the system.

The goal of the WGFD work was to describe the population dynamics of wild and hatchery trout within the Salt River and its tributaries and characterize post-stocking and spawning movements within the system. Objectives included:

1. Provide 3 years of population estimates of game fish in representative reaches of the mainstem Salt River and describe presence and relative abundance of nongame fish throughout the mainstem,

2. Describe the movement and migration patterns of trout between the Salt River, tributary streams and Palisades Reservoir,
3. Utilize a programmed creel survey to determine catch statistics for wild and stocked SRC and all other fish species in the upper and lower valleys of the mainstem river,
4. Document the distribution and quality of physical habitat features important to fish in each study reach,
5. Evaluate the catchable SRC stocking program on the river,
6. Determine the impacts of whirling disease on Salt River salmonids, and
7. Provide recommendations for managing the Salt River sport fishery.

Results of the project are summarized below, including bulleted, numbered management recommendations.

### Trout Population Estimates

Population estimates were conducted on four 3-mi reaches in 1995, 1996 and 1998. Study areas were distributed throughout the lower 40-mi of river and represented the diversity of habitat types in lower Salt River. The average trout population (1995, 1996 and 1998) in the mainstem Salt River was 1,111 trout per mile. Estimates were highest at the site between Highway 238 and the lower East Side Diversion (1,671 trout per mile), followed by the Thayne Lane site (1,194 trout per mile), Auburn Grover Lane (858 trout per mile) and Etna Lane (719 trout per mile). Corresponding average biomass estimates were 698 lb/mi at Highway 238 (red ribbon), 556 lb/mi at Thayne Lane (red ribbon), 378 lb/mi at Auburn Grover Lane (yellow ribbon) and 238 lb/mi at Etna Lane (yellow ribbon). The overall average biomass estimate was 468 lb/mi (yellow ribbon).

Evaluation of the quality of 1995-1998 population estimates showed that most of the individual size group estimates were poor. Quality increased when estimates were pooled (<25% coefficient of variation). Estimates done before 1995 were generally worse. All future estimates on the Salt River should include at least two electrofishing rafts and three sampling occasions. Any less effort will produce unreliable estimates and will not allow estimate stratification into species and size categories. Estimate quality was generally poorest in the Auburn-Grover Lane and Etna Lane reaches.

1. Estimates should be conducted every three years at three sites (Auburn-Grover Lane, Highway 238 and Etna Lane) to monitor trout populations on the mainstem Salt River. Estimates were last conducted in 2002 and therefore should be conducted again in 2005.
2. Estimates should be conducted with two electrofishing rafts and a minimum of three electrofishing passes. Any effort short of this will produce unreliable estimates. Four electrofishing passes should be considered at the Auburn-Grover Lane and Etna Lane study sites.

The 1995-1998 average species composition in the mainstem Salt River (trout per mile) was 57% BNT, 33% wild SRC and 9% stocked SRC. Rainbow trout, rainbow x Snake River cutthroat hybrids (RXC), BKT and LAT were also encountered, but in very low abundances. Brown trout outnumber SRC in three of the four population estimate study reaches, but SRC outnumber BNT in the reach downstream of Etna Lane. In general, the proportion of BNT in the population increases and the proportion of SRC decreases with upstream progression from Palisades Reservoir.

When 1995-1998 population estimates at the upstream three sites are compared with historical averages, estimates of SRC have increased from 313 per mile to 414 per mile. Estimates of BNT have increased from 497 per mile to 821 per mile. The proportion of BNT in the population increased only

slightly from 61% to 67%. Comparing historical single-pass electrofishing catch data with 1997 information reveals no substantial change in species composition in the most upstream reaches of the mainstem river. Although trout populations have increased, the relative abundances of SRC and BNT have not changed substantially over the past 20-30 years.

Rainbow trout are very rare in the mainstem Salt River and are concentrated in the most downstream reaches, especially from Etna Lane to the McCoy access area. Laker Spring Creek, just downstream of Etna Lane seems to be the major spawning area for RBT in the Salt River drainage. Rainbow trout readily hybridize with SRC and should be considered a major threat to the future of SRC in the Salt River drainage. In this study, hybrids were found as far upstream as Highway 238.

3. Biologists should remove RBT. Efforts could involve spring spawning traps on Laker Spring Creek and electrofishing removal in Laker Spring Creek and the mainstem Salt River downstream of Etna Lane. These efforts will not totally eliminate RBT from the system, but would substantially decrease the threat of hybridization with native SRC.

Over-winter survival of catchable-sized SRC stocked in the Salt River is minimal. Few are caught the year after stocking. From 1995-1998, catchable-sized SRC comprised 9% of the total trout population and 20% of the SRC population. Salt River wild BNT and SRC populations are sufficient to support a fishery without the annual stocking of 10,000 catchable-sized SRC. For additional information on the stocking evaluation, see Recommendation 19 and associated justification.

Estimates of all size groups of BNT were stable at all four sites from 1995-1998. Estimates of all size groups of wild SRC also remained stable at the Highway 238 and Thayne Lane sites from 1995-1998. At the Auburn-Grover Lane site, numbers of wild SRC in the 11.0-18.0 in and >18.0 in length groups increased from 1995-1998, but the numbers of 6.0-10.9 in wild SRC declined 50% from 1995-1996 and remained at this level through 1998. At the Etna Lane section, estimates of all size groups of wild SRC exhibited sharp declines from 1995-1996 and continued through 1998. Reasons for declines are not readily apparent. These declines are over a very short time period, and could simply reflect natural population fluctuations. However, the threat of whirling disease cannot be dismissed, especially given the low gradient of these reaches and their proximity to infected spring creeks that likely provide SRC spawning and nursery habitat. Future population estimates should determine whether or not these declines are short-term. See the Whirling Disease chapter of this report for additional information on whirling disease in the Salt River drainage.

A strong relationship was found between single-pass catch rates and population estimates. However, the regression equation that was developed tended to underestimate the proportion of BNT and overestimate the proportion of wild SRC in the population. In addition, for larger sized trout, single pass catch rates tended to overestimate population density. Keeping these points in mind, single-pass catch rates were used to further define the relative abundance of trout species throughout the mainstem Salt River. In the future, single pass electrofishing may be a useful tool to increase either the spatial or temporal scope of a study without a tremendous increase in time.

Effects of removing the seasonal fishing closure were difficult to assess due to insufficient historical data. Seasonal fishing closures were lifted below the Highway 238 Bridge in 1978, but the season was closed from November 1 through March 31 upstream of the bridge. The regulation essentially protects spawning BNT in the upstream reaches of the Salt River. Comparing historical single-pass electrofishing catch data with 1997 information reveals no substantial change in the species composition in the most upstream reaches of the mainstem Salt River since 1978. However, BNT outnumber SRC in three of the four 1995-1998 population estimate study sites and the lowest proportion of SRC is in the reach where BNT spawners are protected. This regulation is protecting the non-indigenous BNT without

equal protection for native SRC and is contrary to the principle management objective in this drainage; preserving the integrity of the indigenous SRC.

4. The fall fishing closure (November 1-March 31) upstream of Highway 238 should be eliminated.

Elimination of the upstream closure would eliminate special protection for wild BNT populations. Because SRC are much more vulnerable to angling than BNT, further protection of the native SRC population is advisable because they are a unique, indigenous species with a limited distribution. However, biologists need to understand when and where SRC spawn in the drainage to direct protective measures.

5. A radio telemetry project should be conducted to define where Salt River SRC spawn and rear, and these areas should be protected with seasonal closures, angling restrictions and/or habitat protection and rehabilitation measures.

Evaluation of the 1990 slot length limit regulation is difficult because of insufficient historical data and no overall goal for the regulation. Population size structure does not appear to be different between the special regulation site and the other three sites. Based on limited pre- and post-regulation population data, no change in population size structure is apparent. It is highly unlikely that the regulation has impacted trout populations. The Highway 238 site has the highest three-year average population estimates of wild SRC and BNT, but excellent habitat conditions in this reach are most likely responsible.

6. Changes in fishing regulations, stocking rates or other management practices should be evaluated with population estimates before and after the change takes effect.

### Mountain Whitefish

Mountain whitefish and SRC are the only salmonids native to the Salt River drainage. Salt River MWF have received a great deal of management attention, mainly centered on removal to alleviate perceived competition with trout and foster positive public relations. Special winter fishing seasons, seining and electrofishing have been used to reduce MWF populations. Mountain whitefish so removed were used as food. Unfortunately, MWF abundance was not monitored consistently, so population trends are unknown. The goal of the MWF part of the Salt River report was to develop a consistent, repeatable method to monitor MWF abundances in the mainstem Salt River.

Mountain whitefish sampling was done on eight quarter-mile reaches located upstream and downstream of each of the four population estimate study reaches, each reach was electrofished with two boom-mounted electrofishing rafts. Since it was often impossible to net all MWF, the netter and oarsman made a best-guess estimate of the percentage of MWF that were actually captured.

Results showed single-pass electrofishing was a useful tool for monitoring MWF abundance across sites and years. Future data will provide more insight into the relative merits of single-pass versus three-pass catches and actual catch rates versus adjusted catch rates. Spatial patterns in MWF abundance were very similar in both 1997 and 1998 and mirrored spatial patterns of trout abundance. In both 1997 and 1998, the highest average length, weight and abundance of MWF was recorded at the upstream Highway 238 site, just upstream of the southern Highway 89 bridge. Both Thayne Lane sampling sites had the next highest abundance of MWF, followed by Auburn-Grover Lane and finally Etna Lane. Apparently, higher MWF abundance coincides with higher stream gradient.

7. Mountain whitefish monitoring in the Salt River should continue during routine population estimate electrofishing. If possible, all sampling should be conducted in August to alleviate potential bias associated with seasonal MWF movement patterns. Analysis of catch rates, adjusted catch rates, mean lengths and weights, mean relative weights and length frequency histograms will provide insight into how the Salt River MWF population fluctuates through time.

One potential problem with the MWF monitoring procedure used in this study is that previous electrofishing passes on the same quarter mile reach may affect the independence of subsequent passes. Whitefish may be concentrated toward the bottom of the reach and not have time to repopulate upstream habitats before the next electrofishing pass.

8. Three different quarter-mile reaches should be sampled with two electrofishing rafts above and below each population estimate reach. The reaches should be spaced a quarter-mile apart and should be conducted from downstream to upstream on the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> electrofishing passes, respectively. The sites downstream of the Lower East Side Diversion could be eliminated if time is a concern. This site is downstream of the ordinary take-out for the population estimate reach. Biologists should continue to tally catch from each electrofishing raft separately.
9. Since population estimates cannot be calculated, electrofishing effort should be as consistent as possible between sites and years. The same netter and rower should be utilized for all MWF sampling in a given year, and should be the most experienced crew available.
10. Detailed habitat information on 24 miles of the mainstem Salt River was collected in 1998 and 1999, and corresponds with the MWF sampling sites. This information will be evaluated in a separate administrative report. Relationships between MWF catch rates and adjusted catch rates should be related to habitat information in this report.

Age 0 and I MWF were found throughout the mainstem Salt River in 1997 and 1998. Length frequency information showed that in 1998, young-of-the-year MWF were 3-4 in TL and age I MWF were approximately 7 in TL. Scale and otolith samples were collected from MWF in 1997 and a MWF age and growth study was conducted in 1953.

11. Mountain whitefish age and growth information collected in 1997 should be evaluated along with trout information and included in a separate administrative report. Comparisons should be made with information collected on the Salt River in 1953 to assess any changes through time. Information can also be compared with that from other MWF populations in the Rocky Mountains.

The Salt River MWF population is virtually unexploited by anglers. Creel information collected in 1998 indicated that MWF constituted an estimated 3% of the catch and 2% of the creel. In general, anglers do not target MWF, but when they are caught, they are harvested at the same rate as trout. Based on the numbers of MWF observed during this study, the population could sustain a more liberal harvest. However, harvest will remain low unless angler attitudes change.

Although mountain whitefish are considered a sport fish in Wyoming, there are currently no standardized monitoring efforts being carried out on Wyoming waters. This lack of monitoring is usually a result of not being able to monitor trout and MWF concurrently. The MWF monitoring program outlined in this chapter will allow a crew to estimate the relative abundance of MWF at a negligible cost in terms of time and effort.

### Creel Survey and Stocking Evaluation



Public opinion has played a major role in management of the Salt River fishery for at least 35 years. Five programmed creel surveys and a mail survey were conducted between 1970 and 1988. The results of each of these surveys are summarized in detail in this chapter.

One of the primary components of the Salt River project was also a programmed creel survey. The survey objectives were to estimate fishery harvest and utilization, evaluate angler satisfaction, evaluate the catchable SRC stocking program on the river and make recommendations for managing the fishery based on these results.

The creel survey study area was divided into an upper river section extending from the Clark's Barn access area to Thayne Lane and a lower section between Thayne Lane and the McCoy access area. Two creel clerks were employed to conduct the creel survey (1 per section) from May 15 to October 31, 1998. An access point survey estimated bank angling pressure and a complete census utilizing video surveillance cameras quantified boat angling pressure. Postage paid creel survey cards were used to gather interview data from anglers that could not be contacted directly by the creel clerks. Separate analyses were conducted for the upper and lower creel survey sections. A similar methodology should be used for future creel surveys.

12. Video surveillance systems should be used to census boat anglers during future programmed creel surveys.
13. During future surveys, biologists should try to place camera systems within a short distance of the 1998 sites in order to facilitate direct comparisons of data between years.
14. Due to the amount of time required to maintain the cameras, at least two creel clerks should be hired to conduct the survey. Biologists should also consider employing a third clerk (possibly part-time) to maintain camera systems, thereby providing additional time for other clerks to conduct interviews.
15. Creel surveys should be closely supervised to ensure that clerks are collecting data correctly and that any problems are identified and quickly resolved.
16. Creel cards provided an effective means to nearly double the number of completed trip interviews and should be used during future programmed creel surveys.

Results indicated that the number of anglers fishing the Salt River decreased significantly between 1970 and 1988. However, catch rates increased enough that the total number of fish caught has remained relatively stable when compared to past surveys. So, fewer anglers are now fishing the Salt River, but they are more successful than in the past.

Nearly 84% of all Salt River anglers were bank anglers. Bank angling pressure was highest in July and numbers of boat anglers peaked in August. Total catch and catch rate of SRC were highest in August in both study sections, although SRC catch was much higher in the lower study section than in the upper section. In the lower river, approximately 2.5 times as many anglers fished per weekend day as did per weekday. Some anglers, particularly outfitters, were disturbed when they found that the stretch of river that they planned to fish was being electrofished that day.

17. In order to disturb as few anglers as possible, biologists should avoid electrofishing on weekend days in July or August when conducting future population estimates.

The distribution of anglers between various reaches of the Salt River has remained remarkably consistent since 1970 and appears to be largely related to access. The lack of bank angling between Thayne Lane and Etna Lane is due to limited public access. Very few boat anglers fished from Clark's Barn to Auburn-Grover Lane in the upper river or from Freedom Lane to Etna Lane in the lower river in 1998. These are the only two stretches of river between Afton and Palisades Reservoir that are not easily accessed by boat anglers.

18. Until boating access is improved, the stream segments from Clark's Barn to Auburn-Grover Lane in the upper river and from Freedom Lane to Etna Lane in the lower river could be eliminated from future boat surveys to reduce the amount of time required to maintain video camera systems.

Catch rates were so high in 1998 that the total number of fish caught exceeded 1970 and 1988 even though pressure had declined substantially. Boat angler catch rates have increased steadily from 0.50/hr in 1970 to 1.01/hr in 1988 and 1.55/hr in 1998. The 1998 bank angler catch rate was also the highest that has been estimated from a programmed creel survey on the Salt River; 0.93/hr. Catch rates on the Salt River are comparable to catch rates on some of the better trout fisheries in the state. In fact, the boat angler Salt River lower valley catch rate is one of the highest ever measured in the state. These data contradict the periodic complaints of anglers who claim that the fishing on the river isn't what it used to be.

SRC, which constitute only about one third of the trout population, account for 60%-70% of the salmonid catch. BNT are obviously more difficult to catch than SRC. Few RBT and MWF were captured in either study section. Although catch rates have increased since 1970, harvest rates have steadily fallen. Harvest rates in 1970, 1988 and 1998 were 86%, 43%, and 13% respectively. Anglers do not appear to be selecting larger than average trout for harvest. When all species were combined, 11.0-11.9 in trout was the most common size class creeled in the upper river, while 9.0-9.9 in trout was most common in the lower river.

MWF were more abundant than all trout species combined in both study sections. MWF densities were too high to measure while conducting trout population estimates, yet only about 4% of fish caught by Salt River anglers in 1998 were MWF. Years of whitefish seining and whitefish fries, special winter whitefish seasons, and liberal harvest regulations have failed to increase angler's interest in fishing for MWF. Regardless, given the publicity and the lack of response by anglers, it is very likely that the MWF population will remain underutilized.

In 1970, only 23% of Salt River anglers were Wyoming residents. This increased to 56% by 1988 and was similar in 1998 (50%). Most resident anglers resided in Lincoln County; 92% in 1970, 82% in 1988 and 84% in 1998. Nearly all anglers pursued trout, but most had no species preference. Although anglers catch primarily SRC, many residents do not value this native cutthroat trout. Only 9% of lower river anglers and 2% of upper river anglers preferred to catch SRC. Nonetheless, most anglers were very satisfied or somewhat satisfied with fishing on the river.

We estimated that in 1998, 4,230 catchable SRC were stocked in the upper survey section and 5,640 were stocked in the lower section. The WGF D stocking evaluation criteria requires that at least 50% of catchables return to anglers. A maximum of 31% of the catchables stocked in the upper river returned to anglers and 60% of those stocked in the lower river returned to anglers. The stocking success criterion was not met in the river between Afton and Thayne Lane, but it was met in the river downstream of Thayne Lane.

The largest irrigation diversion on the river, the East Side Diversion, is located at the Murray access within the special regulation section of the upper river. The diversion dam creates a large pool upstream of the dam and the actual diversion is in the corner of this pool. Catchable SRC are stocked directly into this pool, within 25 yards of the irrigation diversion. The pool seems to be an ideal location for development of handicap fishing access. A properly designed dock could easily withstand high flows at this location and would allow anglers to effectively fish this pool. In addition to being very scenic, the area is very close to the rest area on Highway 89 and is centrally located in the valley.

Although the pool above the East Side Diversion Dam at the Murray access area was within the upper river study section, stocked catchables would most likely return very well from this popular area. However, as mentioned previously, the East Side Diversion is in the northeast corner of this pool and stocked SRC are very likely to end up in the diversion canal.

19. Stocking of catchable SRC should be eliminated from the river above Freedom Lane with the exception of the Murray access area. Stocking should be eliminated unless the stocking program meets evaluation criteria (>50% harvest of stocked catchables).
20. Efforts should be made to screen the East Side Diversion canal to prevent trout loss to the canal. Biologists should quantify fish losses to irrigation canals throughout the Salt River drainage and those responsible for substantial losses should be screened.

The river upstream of Highway 238 is currently closed to fishing from November 1 to December 31. So, spawning brown trout are now protected in the river upstream of Highway 238. Since the management objective of the Salt River is to manage for wild SRC, it seems counterproductive to protect all brown trout from harvest during spawning. The fall fishing closure upstream of Highway 238 should be eliminated (Recommendation 4).

The special regulation on the Salt River between the southern Highway 89 Bridge and Thayne Lane, limits harvest to four trout per day, 1 over 18 in and all trout 11.0-18.0 in must be released. Fishing is with artificial flies and lures only. Cutthroat trout rarely exceed 18.0 in on the river, so this regulation essentially protects all cutthroat over 11.0 in and limits the harvest of BNT to 1 over 18.0 in. This size regulation should be eliminated and the regulation in the rest of the mainstem should be modified so that the size regulation in the entire Salt River drainage upstream of Palisades Reservoir is consistent with the regulation in the lower Snake River drainage. Due to the obvious vulnerability of SRC to angling and the fact that the primary fisheries management objective in this drainage is to maintain populations of this native species, a consistent regulation that reduces the harvest of SRC is reasonable.

21. Fishing regulations for the entire Salt River drainage upstream from the McCoy Street Bridge should be changed to "Six (6) trout per day or in possession, one may exceed twenty (20) inches, but no more than three (3) shall be cutthroat trout and only one (1) cutthroat may exceed twelve (12) inches."
22. Regulations in the Salt River drainage must be specified in the fishing regulations because there is a November 1 – May 20 closure throughout the lower Snake River drainage that will not apply to the Salt River drainage.

There are currently inconsistent boundaries pertaining to season and tackle restrictions that unnecessarily complicate the regulations for the reach of river between the Highway 238 Bridge and Thayne Lane. The current regulations place the Murray access area and the pool above the East Side Diversion Dam within the special regulation section. If the diversion could be screened, the Murray

access area would be a reasonable location to stock catchable SRC. But it is unrealistic to manage a put and take trout fishery by a restricted tackle regulation.

23. The upper and lower boundaries of the special regulation reach should be shifted upstream to extend from the northern Highway 89 Bridge upstream to the Highway 238 Bridge. The slot length limit should be eliminated and replaced with the new drainage-wide creel limit (above), but angling should remain restricted to artificial flies and lures only.
24. This shift will open the Murray access area to drainage-wide regulations (see recommendation 21). Handicapped access should be developed in this area to provide handicapped anglers opportunity to fish with bait and harvest stocked catchable trout.

This shift would also place the Willow Creek confluence near the middle of the special regulation section, rather than at the upstream end. Burckhardt (M.S. thesis) suggested that Willow Creek might be an important spawning tributary for SRC. The proposed change in the boundaries of the special regulation section would offer some additional protection for SRC that stage in the Salt River near the Willow Creek confluence.

As long as catchable SRC are stocked in the lower river, modified regulations (1 SRC larger than 12 in) should not limit harvest. Since most stocked SRC caught by anglers are captured during the summer in which they were stocked, SRC should be stocked at an appropriate size so that few will be larger than 12.0 in during peak angling in July and August.

25. SRC should be stocked at 8.0 – 10.0 in. If the Jackson National Fish Hatchery cannot produce this size of Bar-BC SRC for stocking before early August, consider switching to the Auburn strain SRC.

The Salt River between Afton and Palisades Reservoir is a unique and valuable resource. Numerous access areas are available to bank and boat anglers throughout the valley. Rainbow trout are rare and have had little impact on native SRC to date. Catch rates are high and fishing pressure low, particularly when compared to the Snake River. The primary fishery management challenges are related to habitat and potential development associated with an increasing human population. Due to the rate of human population growth in the valley and the potential affects on fish populations and habitat, biologists should

26. Conduct programmed creel surveys in the upper and lower river sections at least every 10 years.

### *Nongame Fishes*

In addition to mountain whitefish and Snake River cutthroat trout, 10 fish species are presumed native to the Salt River. These include the Utah chub, leatherside chub, longnose dace, speckled dace, redbreast shiner, Utah sucker, bluehead sucker, mountain sucker, mottled sculpin and Paiute sculpin (Baxter and Stone 1995).

Due to the limited information on the distribution of nongame fishes in the mainstem Salt River, an attempt was made to collect and identify as many non-game species as possible during 1997 and 1998 electrofishing. These data were combined with nongame fish information collected by Isaak (UW PhD student) in 1996 and 1997 and Wheeler (UW MS student) in 1997 to determine the presence and distribution of nongame fishes in the Salt River drainage.

The FPU and FMJN collected nine of ten Salt River nongame fish species in the mainstem Salt River with raft electrofishing equipment. Leatherside chub was the only species not collected in this study. Isaak collected a total of eight species in his survey of Salt River tributaries and Wheeler collected seven species. However, when all surveys are combined, all 10 species of nongame fish thought to occur in the Salt River drainage were collected between 1996 and 1998.

Utah suckers are one of the most abundant species in the Salt River drainage and large congregations were commonly electrofished in deep pools. Mountain suckers appeared to be very rare in the mainstem Salt River, but were common in mountain tributaries. Only one bluehead sucker was collected. Mottled and Paiute sculpin were common and were collected in all mainstem sampling reaches in both years and in most streams sampled by Isaak. Redside shiners, longnose dace and speckled dace all showed fairly widespread distributions and were considered common in the mainstem Salt River as well. On the other hand, Utah chubs showed a relatively limited distribution, only occurring downstream of Freedom Lane.

27. On the Salt River, bluehead suckers are rare (only one specimen was collected). Given its rarity in the Salt River and its decline in other drainages of the state, additional work should be done to further define the range and abundance of this species in the Salt River.

Leatherside chubs were not collected from the mainstem Salt River, but were found to occur in the Jackknife Creek drainage by Isaak. This is the first reported collection of this species from the Salt River drainage. Whether this species is native to the Salt River drainage has been disputed and it may have been accidentally introduced as a baitfish. Regardless, the species is limited to the Jackknife Creek drainage and may warrant special attention. Possible threats to the Jackknife Creek leatherside chub population include cattle grazing and a significant area of the drainage that burned in 1991 (Dan Isaak, personal communication).

28. Leatherside chubs are very rare in the Salt River drainage. Threats to the limited population of leatherside chubs in the Jackknife Creek drainage should be evaluated.

The results of this survey show that it is possible to gather important information on nongame fish distributions while conducting routine trout monitoring work. Most fish distributional surveys that have been conducted in Wyoming have focused on smaller waters that can be sampled with shore-based or back electrofishing gear. Collecting information on distributional patterns on nongame fishes in large rivers will help create a more complete picture of fish distributions throughout Wyoming.

29. Collection and identification of nongame species should be routine when conducting trout population estimates on Wyoming rivers. These collections, when compared with previous surveys will provide a more complete picture of Wyoming's nongame fish distributions.

### Whirling Disease

Whirling disease, caused by the parasite *Myxobolus cerebralis*, has been implicated in population level declines of wild rainbow trout in Colorado and Montana. The parasite attacks the cartilage in developing trout and acute infections can lead to clinical conditions such as cranial and skeletal deformities, black tails or "whirling" behavior caused by damage to equilibrium organs. Much research has been conducted over the past decade and experts are just beginning to understand the dynamics of the parasite in the wild. Research has shown that water temperature, fish species and age and the exposure dosage all influence the effects of *M. cerebralis* on a trout population.

**Comprehensive Study of the Salt River Fishery Between Afton and Palisades  
Reservoir from 1995-1999 with Historical Review; Fur Trade-1998**

**August 2002**

**by**

**Kevin R. Gelwicks  
David J. Zafft  
Rob D. Gipson  
Tracy J. Stephens**

**Wyoming Game and Fish Department  
Fish Division  
5400 Bishop Blvd.  
Cheyenne, WY 82006**

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