Regional Aquatic Wildlife Management Progress Report

Pinedale Region Aquatic Habitat and Fisheries Management

Calendar Year 2006

Activities associated with Multiple Basins

Goal: Minimize threats and assure long-term prosperity of the native aquatic organisms throughout their historic range with emphasis on enhancement, restoration, and preservation, of habitats using an integrated watershed or landscape approach.

Objective: Coordinate conservation efforts with appropriate state, federal, tribal and other appropriate organizations in order to eliminate or reduce threats to native species.

- Kemmerer BLM-RMP. 540

The draft "Final Preferred Alternative" was released to the cooperating agencies in January. Numerous regional comments and recommendations pertaining to a wide variety of on-going concerns were provided to Habitat Protection.

Significant portions of this effort both directly and indirectly involved other RMP revisions so have implications on a statewide basis. Examples of some of these efforts include: reviewing and disseminating information from various BLM policy manuals, reviewing and commenting on the Department's "Mitigation Strategy" document, and reviewing, discussing and disseminating information related to various stream classification methods.

Kemmerer BLM notified cooperating agencies on February 23, 2007 that they were instructed to fast track this RMP process. The next opportunity for cooperator review on the Preliminary Draft Environmental Impact Statement (PDEIS) is scheduled for late March and early April 2007. The BLM anticipates publishing the PDEIS for public review in late June 2007.

Objective: Identify wildlife habitats where habitat quality should be preserved (i.e. fee title acquisitions, conservation easements, leases, agreements, etc.) and work with Lands Administration (Lands) to implement.

- Forage Reserves and WHMAs. 540

Continued to aggressively promote development of forage reserves and creation of additional WHMAs and other large-scale conservation opportunities in the region. These efforts are being pursued to help increase opportunities to implement landscape and watershed scale projects in the Region as promoted in the Strategic Habitat Plan. The primary opportunity pursued was the Triple Peak Forage Reserve Project, reported on under the Cottonwood Watershed Projects. Another opportunity consisted of completing HAEP forms for two adjacent properties located in the upper Green River and submitting these to the property rights team for review. One property owner is primarily interested in a conservation easement. The second, related landowners have their property listed for sale on the open market, but indicated an interest in a wide variety of conservation opportunities.

Objective: Increase public awareness of the importance of preserving and restoring habitat on a watershed scale.

- Public Relationships and Habitat Improvements. 160/240

Continued to promote the watershed / landscape approach to habitat management through discussions regarding aspen management needs and concerns across the Rocky Mountain West and the Little Mountain Watershed Project presentation made at the Deer / Elk Workshop with David Burton who represents the Aspen Delineation Project.

Management Recommendations

- Continue to evaluate properties and grazing allotments within SHP priority areas available for acquisitions, conservation easements, leases, agreements, etc. and work with other Department personnel, land management agencies, and NGOs to promote enhancement, restoration, and preservation, of habitats using an integrated watershed or landscape approach.

- Continue to promote multiple species, watershed / land management philosophies to the public and other professionals as opportunities allow.

Beaver Creek Basin - 7BE (HUC 1404010103)

Goal: Assure long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminate threats from non-native salmonids, enhance habitats as opportunities arise, and protect the non-native sport fishery in those waters not managed for native salmonids.

Boulder Creek Basin - 7BO (HUC 1404010205)

Goal: Maintain a recreational fishery resource for interested stakeholders.

Objective: Monitor the KOE population in Boulder Lake.

- Fish Population Survey. 512

Monitor Boulder Creek in September to determine if any of the early-run KOE have matured. This work could not be accomplished due to early resignation of all seasonal employees. However, the Aquatic Assessment Crew used HY gear and mesh curtains to enumerate the KOE population. That crew was also in charge of data analysis, and results can be found in their portion of the annual progress report.

Several concerned members of the public contacted the Wyoming Game and Fish Department about dead fish seen in the headwaters of the Boulder Creek drainage. The reports were not received until several days or even weeks after the fish were observed, so efforts to gather additional information was unsuccessful. However, one of the reporting parties with extensive experience in the area mentioned that water temperatures were noticeably warmer in 2006 than he has ever experienced. Therefore, given this information and the fact that runoff was low in 2006, it is assumed that the die off was related to high temperatures and low flows.

Objective: Determine angler success.

- Collect spot creel data. 520

Twenty bank anglers, 24 boat anglers, and 2 ice anglers were contacted on Boulder Lake in 2006. Sublette County anglers made up 43% of the anglers interviewed, while Sweetwater County residents made up 24% of the total. Non-residents from Colorado made up 17% of the total, and Utah residents made up 9%. Residents from other Wyoming counties made up the remainder of those interviewed. Bank anglers interviewed caught 0.02 BNT/hour (0% harvest), 0.02 LAT/hour (100% harvest) and 0.17 RBT (60% harvest), for a catch rate of 0.21 fish/hour (58% harvest). The objective of 0.2 RBT/hour for bank anglers was nearly met. Boat anglers caught 0.38 LAT/hour (74% harvest), meeting the objective catch rate of 0.25 LAT/hour. Boat anglers also caught 0.02 RBT/hour (100% harvest). Ice anglers caught 0.50 LAT/hour (100% harvest).

Management Recommendations

- Continue to monitor the KOE population in Boulder Lake to determine if it will provide a backup brood stock for the early-run stock. Continue to collect creel survey data when anglers are encountered and monitor the fish community in Boulder Lake every 3 to 4 years.

<u>Bear River Basin - 7BR (HUC 1601010108/109/201)</u>

Goal: Assure long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminate threats from non-native salmonids, and enhance habitats, while providing for a recreational fishery.

Objective: Establish baseline datasets for BRC and LSC populations.

- <u>Sample streams with little or no historic data</u>. 512

Two stations on Rock Creek that had been previously sampled were monitored in 2006. The lower station (located at 6,790 feet above sea level) showed a large increase in BKT density and a decline in BRC density (Table 1). Single pass electrofishing data from 1975 showed that BKT were very numerous at that time, so the fish community appears to be moving back toward population densities noted historically. The BRC captured in 2006 had very bright coloration, and SRC were planted in the 1950s and 1960s, so their purity is questionable. Unfortunately, population estimates were not made for non-game species in the past, so quantitative comparisons among other species cannot be made. However, MSC are still abundant, and MTS and SPD are both still present. RSS were not noted in past years, and they are currently rare. LSC were not documented in the past, but this may have been an oversight, as they are difficult to distinguish from SPD without careful observation. Some of the LSC captured in 2006 appeared to be hybridized with SPD.

Table 1. Population estimates (number per mile) and average length of fish captured in Rock Creek (elevation 6,790). The second number shown is the coefficient of variation, expressed as a percentage (CV%) or the range of lengths captured (Range). Species that were captured in numbers too low to calculate a population estimate are denoted with an asterisk. More LSC were captured on the second electrofishing pass than on the first pass in 2006, so an accurate population estimate could not be made. The number shown is a minimum estimate based on the total number of fish captured.

Species	Number / Mile CV%			Average Length Range		
	1991	2000	2006	1991	2000	2006
BKT	12 43.3	-	85 35.3	3.0 1 fish	-	6.7 5.5-7.3
BRC	211 0	507 22.3	282 3.2	6.4 5.6-12.9	7.5 4.3-14.0	7.3 3.5-12.7

LSC	-	-	>=99 NA	-	-	3.1 2.5-4.1
MSC	abundant	abundant	1,408 37.6	no data	3.5 2.9-4.1	3.6 2.4-5.0
MTS	present	-	56 86.5	no data	-	6.1 5.6-6.5
RSS	-	-	14 0.0	-	-	3.6 -
SPD	-	present	127 23.6	-	no data	2.9 2.5-3.4

The upper electrofishing station on Rock Creek (elevation of 6,902 feet above sea level) also showed an increase in BKT density and a decrease in BRC density in comparison to data collected in 1992 (Table 2). Historic population estimates are not available for non-game species at this site, but MSC are still present. LSC, MTS, and SPD were all collected in 2006, but not recorded in 1992. It is not known if these species were not present at that time or just not recorded.

Table 2. Population estimates (number per mile) and average length of fish captured in Rock Creek (elevation 6,902). The second number shown is the coefficient of variation, expressed as a percentage (CV%) or the range of lengths captured (Range). More LSC were captured on the second electrofishing pass than on the first pass in 2006, so an accurate population estimate could not be made. The number shown is a minimum estimate based on the total number of fish captured.

Species	Number / Mile CV%		Average Length Range	
	1992	2006	1992	2006
BKT	19 0	77 86.5	7.5 1 fish	6.5 6.1-6.7
BRC	77 0	38 0	8.2 5.9-9.4	4.4 4.2-4.7
LSC	-	>=38 NA	-	3.2 3.1-3.3
MSC	present	1,153 24.5	-	2.9 2.3-4.5
MTS	-	58 0	-	5.4 5.2-5.6
SPD	-	38 0	-	2.8 2.6-3.1

The Bear River was sampled at Pixley Diversion in order to try to confirm whether reports of YEP and WAE from anglers were reliable and to document other species inhabiting the area. One ER was set across a large pool below the dam and BP was used to capture small fish and drive larger fish into the ER. This technique proved to be ineffective; large fish (probably CRP) were seen jumping over and swimming under the ER. None of the target species were found, but CRP, LND, MTS, RSS, SPD, and possible SPD X LND hybrids were captured.

A limited number of surveys were conducted in an effort to document the distribution of herptiles in the Bear River basin. Two ponds in the upper end of the Rock Creek drainage were sampled with a BS on June 3, 2006. Adult SAL were collected from both ponds, but larvae were only collected from one pond. No other amphibian or reptiles were observed.

Management Recommendations

- Analyze the genetic purity of BRC and LSC in Rock Creek. Monitor population densities at established electrofishing stations within 3 to 5 years to determine if the trend of increasing numbers of BKT and decreasing numbers of BRC continues in Rock Creek.

- Continue to search the Bear River for YEP, WAE, and any other exotic species that are reported by the public. Continue to document herptile and mussel locations when they are observed.

- Continue to work cooperatively with the BLM, Fossil Butte National Monument, and other Department personnel to ensure the Rock Creek prescribed burn vegetation objectives are met.

- Continue to work cooperatively with the BLM, Fossil Butte National Monument, NRCS, and other Department personnel to monitor the effectiveness of habitat treatments and management actions in the Rock Creek watershed to ensure vegetative objectives are met

<u>Cottonwood Creek Basin - 7CO (HUC 1404010106)</u>

Goal: Assure long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminate threats from non-native salmonids, and enhance habitats as opportunities arise, while providing for a recreational fishery. Restore connectivity in drainage to provide movement for all species.

Objective: Provide habitat protection in the Cottonwood watershed.

- <u>Habitat Protection and Enhancement</u>. 540

<u>Cottonwood drainages:</u> The grazing permitee in the Cottonwood, North Piney and Grey's River watersheds has agreed to waive his grazing permit for 2,726 AUMs of domestic sheep use back to the Bridger-Teton National Forest. Department personnel provided information to Trout Unlimited, other NGOs, the USFS, and the grazing permittee on the importance of these watersheds for aquatic and terrestrial wildlife. Cooperative efforts with the NGOs to raise funding for this project and coordination with the U.S. Forest Service are on going. Extensive coordination efforts resulted in a management agreement mutually acceptable to the USFS, permittee, and NGOs. The project includes 5 allotments, totaling 58,657 acres and will provide long-term protection to important CRC and SRC habitats.

Project implementation will ensure the long-term, sustainable health of vegetative communities and create a forage reserve to facilitate future treatments to benefit fish and wildlife habitats. Improvement of watershed/vegetative conditions in upland and riparian habitats on 58,657 acres throughout the project area will be accelerated. CRC will benefit from improved conditions in 99 miles of historical stream habitat. The 5,115-acre Lake Creek drainage including North Piney Lake (65-acre) will be closed to livestock grazing to protect this population of CRC, which provides an important component of the Wyoming Game and Fish Department's CRC restoration program as an egg source. Snake River cutthroat trout (SRC) habitat will be improved in 63 stream miles of portions of the Grey's River drainage within the Snake River Watershed. USFS will place the remaining 53,560 acres into Emergency Forage Reserve (i.e. grassbank) status, with strict language/terms/conditions under which this portion of the allotment complex could be grazed by domestic sheep. The acres below 9,700 feet may be available by 2008 for grazing 3 out of every 10 years pending data collection to evaluate the existing vegetative condition and ground cover. To complete the action the USFS will adopt a management plan for the forage reserve. The final vegetative criteria and monitoring methods, time frames, and locations will be cooperatively developed with TU, WGFD, the USFS, and other project proponents once the final payment is made.

As of September 2006, the first installment of $104,952 was provided to the permittee. At this time the US Forest Service and the permittee finalized the buy-out agreement to waive his permit back to the Bridger-Teton National Forest. Balance of payment $209,905 and project completion are anticipated by June 1, 2007, pending available funding.

Objective: Inventory selected CRC populations throughout the watershed and identify purity and genetic diversity of populations.

- Fish Population Survey. 512

Hardin Creek: One sampling site was established and surveyed in the headwaters of Hardin Creek on June 29 using BP for CRC population estimation and presence of non-native fishes. Only BKT were observed with no CRC or non-game species present in the sample reach. Baseline population data were collected. Population estimates were calculated for BKT ≥3 in and ≥6 in using 2 pass removal methods. BKT population ≥3 in was 264/mile. Adult BKT (≥6 in) population estimates are 53/mile (Table 3).

Table 3. Population estimate and mean total length of BKT in Hardin Creek, June 29, 2006.

Species	Elevation	Station Length Feet	No.	Mean Length Inches	≥3/ Mile	C.V. %	≥6/ Mile	C.V. %
BKT	8,183	300	15	4.7	264	0	53	0

In addition to the population survey, a one-pass survey of the stream between the culvert barrier and a location approximately 1000 ft upstream produced 9 CRC (4.0-8.4 in) and 12 BKT (5.6-8.2 in). CRC abundance decreased with increasing distance upstream from the culvert barrier.

A comparison of fish population surveys conducted at lower elevation sampling sites in 2005 with 2006 data conducted in the headwaters of Hardin Creek produced nearly identical results, with no CRC collected in lower elevation or headwater sampling sites. The population estimates for the lower elevation site (elevation. 8,050 ft) were 302/mile for BKT ≥3 in and 50/mile for BKT ≥6. A total of 10 BKT ≥3 in were collected. However, mean lengths of BKT in headwater sites were lower (4.7 in) than lower elevation sites (5.83 in). CRC were not present in the headwaters of Hardin Creek.

The upper distribution of BKT in Hardin Creek was determined. A total of 38 BKT were counted, weighed, measured, and checked for AD clips from starting point (12T E:537631 N:4739170, NAD 27) upstream 2,500 ft to the end of BKT distribution. No CRC were observed. The last BKT (5.5 in TL) was captured approximately 1.77 miles upstream from the culvert/main road crossing (12T E:537566, N:4739052, elevation = 8,310 ft). We stopped electrofishing approximately 2.05 miles upstream from culvert/main road crossing when we had electrofished approximately 400 m upstream of a culvert located at 12T E:537487 N:4738907. This culvert moves water beneath an abandoned logging road. The culvert is constructed of corrugated metal, 25 ft long, set at moderate slope, with approximately a 1 ft perch and approximately 0.5-1.0 ft deep plunge pool. The barrier beneath which the last BKT was found, consists of a series of several drop pools (vertical drop dimensions between 6-12 in tall) located at 12T E:537566 N:4739052 that extended for approximately 20 m upstream.

Irene Creek: One sampling site was established and surveyed in the headwaters of Irene Creek on June 26 using BP for CRC population estimation and presence of non-native fishes. Three species were observed: BKT, CRC, and MSC. Population estimates were calculated for MSC, BKT, and CRC ≥3 in and ≥6 in using 2 pass removal methods. CRC population ≥3 in was 264/mile. Adult CRC (≥6 in) population estimates are 176/mile. BKT population ≥3 in was 299/mile. Adult BKT (≥6 in) population estimates are 106/mile (Table 4). One AD clipped BKT was recovered from the population survey reach that had made its way through the culvert upstream. A population estimate for MSC ≥1 in was calculated as 18/mile (C.V.= 0%). A total of 1 MSC were collected with a mean length of 4.4 in.

Table 4. Population estimate and mean total length of BKT and CRC in Irene Creek, June 26, 2006.

Species	Elevation	Station Length Feet	No.	Mean Length Inches	≥3/ Mile	C.V. %	≥6/ Mile	C.V. %
BKT	8,145	300	16	5.78	299	9.2	106	24.3
CRC	8,145	300	15	7.23	264	5.5	176	4.5

In addition to the population survey, a one-pass survey of the stream between the culvert barrier and a location approximately 1,970 ft upstream produced 7 CRC (2.0-8.1 in) including 1 YOY and no BKT. The lower portion of Irene Creek appears to have more abundant CRC than BKT with evidence of CRC reproduction occurring.

A comparison of fish population surveys conducted at lower elevation sampling sites in 2005 with 2006 data conducted in the headwaters of Irene Creek produced different results. The population estimates for the lower elevation site (elevation 8,020 ft) were 19/mile for BKT ≥3 in and for BKT ≥6. Only one BKT ≤3 in was collected. Population estimates for CRC were 169/mile for CRC ≥3 in and 0/mile for CRC ≥6 with a total of 5 CRC collected. CRC and BKT estimated abundance was greater in the higher elevation portions of Irene Creek than the lower portions. CRC appear to maintain a slight advantage in terms of overall abundance than BKT, however the fact that BKT are present everywhere that CRC are located (including the upper distributional boundary) suggests that CRC long-term persistence may be threatened.

The upper distribution of BKT and CRC in Irene Creek was determined. A total of 5 CRC and 2 BKT were counted, weighed, measured, and checked for AD clips from starting point (12T E:539254 N:4737752, NAD 27) upstream about 500 ft to the end of fish distribution. Only CRC and BKT (no native non-game species) were observed of which no BKT were marked. The last fish (CRC 7.0) was captured approximately 1.7 miles upstream from the culvert/main road crossing (12T E:539094, N:4737790, elevation = 8,350 ft). We stopped electrofishing approximately 2.27 miles upstream from culvert/main road crossing when we had electrofished approximately 430 m upstream of a culvert located at 12T E:538632 N:4737787. This culvert moves water beneath an abandoned logging road. The culvert is constructed of corrugated metal, 42 ft long, set at a steep slope, with no perch and no plunge pool. The water exits the outlet end of the culvert and descends through a very high gradient section immediately downstream of the culvert. The barrier beneath which the last

BKT was found, consists of a small waterfall formed by large woody debris. A fairly large pool is formed just downstream of this site by a relict beaver dam. There was quite a bit of deadfall and large woody debris in and around the stream channel that made electrofishing difficult.

Nylander Creek: A two pass survey was conducted on June 14 using BP to look for AD clipped BKT from just above the fish migration barrier located at 12T E:539355 N:4741534 (NAD 27) upstream to a major spring source protected by a cattle exclosure (wooden poles) located at 12T E:539138 N:4792018. The total distance surveyed is 790 ft. BKT and CRC population estimation was determined. Only two species were collected (MSC present), BKT and CRC. Population estimates were calculated for BKT and CRC ≥3 in and ≥6 in using 2 pass removal methods. BKT population ≥3 in was 87/mile. Adult BKT (≥6 in) population estimates are 20/mile. Two AD clipped BKT were recovered (7.4 in and 5.9 in). CRC population ≥3 in was 214/mile. Adult CRC (≥6 in) population estimates are 120/mile (Table 5).

Table 5. Population estimate and mean total length of BKT and CRC in Nylander Creek, June 14, 2006.

Species	Elevation	Station Length Feet	No.	Mean Length Inches	≥3/ Mile	C.V. %	≥6/ Mile	C.V. %
BKT	8,150	790	13	5.17	87	2.8	20	0
CRC	8,150	790	30	6.14	214	7.6	120	105.6

A comparison of fish population surveys conducted at the identical sampling sites and nearly identical dates on June 15, 2005 with 2006 data produced different results. The population estimates for this site were 33/mile for BKT ≥3 in and for BKT ≥6. Only five BKT ≥3 in were collected. Population estimates for CRC were 13/mile for CRC ≥3 in and 7/mile for CRC ≥6 with a total of 2 CRC collected. Overall CRC and BKT estimated abundance was greater in 2006 than 2005. CRC appear to have an advantage in terms of overall abundance than BKT in this lower stretch of stream, probably related to where stocking occurred and where BKT removal has occurred. Follow up surveys should be conducted in order to monitor whether the increase in CRC abundance is sustainable over time.

Bare Creek: A one pass survey was conducted on June 22 using BP to look for AD clipped BKT from just above the fish migration barrier (culvert) located at 12T E:541546 N:4735545 (WGS 84) to a point approximately 2,300 feet upstream (E: 541246 N:4735066). Only two species were collected; BKT and CRC, however MSC were present. A total of 20 CRC (6.0-14.6 in) and 4 BKT (5.5-10.9 in) were collected (CRC:BKT ratio of 5:1). No marked BKT were recovered. All BKT collected were AD clipped and released downstream of the culvert. These survey results stand in contrast to survey results obtained from the reach starting at the confluence with South Cottonwood Creek 740 feet upstream to the culvert outlet (downstream). Only two species were collected, BKT and CRC. A total of 11 CRC (3.4-9.0 in) and 53 BKT were collected (3.9-10.7 in) were collected (CRC:BKT ratio of 1:5). The sharp contrast in relative abundance is at least indirect evidence that this culvert may be acting as a (partial?) barrier to fish movement from South Cottonwood Creek upstream into Bare Creek. Many CRC collected upstream of the culvert appeared to have fine spots more like SRC. However past genetic analysis have identified these CRC as B or better purity.

Ole Creek: Two sampling sites were established and surveyed in Ole Creek on July 11 using BP for BKT population estimation and presence of CRC. Two species were observed: BKT and MSC. No

CRC were collected or observed. Population estimates were calculated for MSC and BKT ≥3 in and ≥6 in using 2 pass removal methods. BKT population ≥3 in was 70/mile for the lower station and 386/mile for the upper station. Adult BKT population estimates are 35/mile for the lower station and 34/mile the upper station (Table 6). A population estimate for MSC ≥1 in was calculated as 933/mile (C.V.= 10.3%) for the lower station and 117/mile (C.V.=9.0%) for the upper station. A total of 47 MSC were collected in the lower station with a mean length of 2.75 in and a total of 7 MSC were collected in the upper station with a mean length of 2.99 in.

Table 6. Population estimate and mean total length of BKT for two stations in Ole Creek, July11, 2006.

Station	Elevation	Species	Station Length Feet	No.	Mean Length Inches	≥3/ Mile	C.V. %	≥6/ Mile	C.V. %
Lower	8,114	BKT	300	4	6.98	70	0	35	0
Upper	8,151	BKT	315	20	4.36	386	14.6	34	0

The upper distribution of BKT in Ole Creek was determined with one pass only. No CRC were observed, BKT only. There are two primary branches, North (right) and South (left, mainstem) that split. The last BKT caught on the North branch was approximately 1.52 miles upstream of the intersection of Ole Creek with the main road (12T E:536548 N:4740928, elevation = 8,320 ft NAD 27). This fish was captured in a pool below a small waterfall drop below some old beaver dam terraces. There are three headwater streams that feed into the North branch. Each branch was explored by BP until flow ran out (spring source) or we had reached a point at least 400 m beyond the last BKT without encountering further BKT. No BKT were discovered in any of these 3 headwater branches. The last BKT caught on the South branch (mainstem) was approximately 1.22 miles upstream of the intersection of Ole Creek with the main road (12T E:537200 N:4740791, elevation= 8,280 ft). This fish was captured in a shallow pool just above a series of waterfalls. Even though no obvious physical barriers were present just above this point, no more BKT were observed upstream of this location. The South branch was surveyed another 350 m upstream of the last BKT with no more observed. The flow was high upstream of this section, however no BKT were found. One additional small tributary that came in from the river right was surveyed from its start at the confluence upstream to the spring sources, but no BKT were found (location of confluence w/ mainstem Ole Creek is 12T E:537944 N:4740909). Water temperatures were cold throughout the system, between 48 and 49 F throughout the system.

We were unable to conduct 2-3 pass population estimates on 8 creeks (Dry Basin Fork South Cottonwood, Lander, Little Maki, Maki, McDougal, North Cottonwood, South Fork South Cottonwood, and West Fork Bare creeks) due to personnel shortages

We were unable to identify upper TRT distributions on 10 creeks (Bare, Dry Basin Fork South Cottonwood, Lander, Little Maki, Maki, McDougal, North Cottonwood, Nylander, South Fork South Cottonwood, and West Fork Bare creeks) due to personnel shortages.

Objective: Coordinate with USFS and Department BFH & Terrestrial habitat personnel on the Maki Aspen Treatment project to ensure opportunities to enhance aspen to benefit beaver and riparian systems are included.

- Fish Habitat Inventory. 511

Maki Creek: WHAM level 1 surveys were completed on North Maki Creek and partially completed in the Maki Creek drainages. Non-game fish species were observed (visually) in North Maki Creek, but we could not confirm the species. No game species (TRT) were observed. North Maki Creek contained numerous relict beaver dams with very low water flows.

The upper portion of Maki Creek was surveyed (WHAM level 1). CRC were observed and caught (hook and line) in Maki Creek. Both YOY and adult fish were observed visually within the drainage. No other TRT species were observed. Recent beaver activity was present throughout the watershed. Within aspen stands, many older mature trees were present with very few young trees. Conifers were encroaching many aspen stands, especially on north aspect slopes.

The Aquatic Habitat Biologist coordinated with BFH personnel, USFS, and the Regional Fisheries Biologist to assess watershed and aspen community conditions in potions of this drainage. WHAM assessments and evaluations of specific aspen stands were conducted in July. Examples of several key aspen stands in need of regeneration and important from a watershed health perspective were delineated on a map and presented to the USFS for consideration to add to their treatment plans.

Management Recommendations

- Continue monitoring habitat and fish populations in the Cottonwood Creek watershed basin, collecting baseline population data on CRC. Continue to sample habitats where data have not been collected in order to better define the distribution and abundance of CRC and other native species.

- Complete population surveys conducting 2-3 pass population estimates on 8 creeks (Dry Basin Fork South Cottonwood, Lander, Little Maki, Maki, McDougal, North Cottonwood, South Fork South Cottonwood, and West Fork Bare creeks).

- Continue mechanical removal of BKT within this drainage during routine sampling.

- Continue collecting data on potential barriers in the Cottonwood Creek watershed basin. Determine barrier effectiveness and relative vulnerabilities to upstream fish passage. Collect physical barrier measurements on Bare Creek culvert. Write an administrative report on barrier effectiveness on potential barriers within Cottonwood Creek watershed.

- Determine upper distributions for TRT in selected streams within the Cottonwood Creek watershed (Bare, Dry Basin Fork South Cottonwood, Lander, Little Maki, Maki, McDougal, North Cottonwood, Nylander, South Fork South Cottonwood, and West Fork Bare creeks).

- Complete WHAM level 1 assessments in Maki and Little Maki Creeks.

- Continue to identify and prioritize potential additional aspen treatment sites in the Maki watershed and coordinate with the USFS to include these areas in the treatment plans.

- Continue to coordinate and work with landowners to implement and monitor progressive land management practices.

Green River Lower Basin (New Fork River confluence to Fontenelle Reservoir) – 7GL (HUC 1404010107/10/12)

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage.

Objective: Coordinate with cooperative landowners and land management agency personnel to enhance habitat for multiple species.

- Wyoming 3 Bar Ranch. 233/234/240

Habitat improvement and conservation opportunities as well as fisheries management issues were discussed with a representative (Mr. John Bove) for the new owners of the former Pete Olsen ("3 Bar") Ranch located at the confluence of the Green & New Fork Rivers. A follow up letter summarizing our discussions with Mr. Bove was prepared and sent to him in December. Grazing permits in the Blue Rim Desert and Mesa common Allotments are associated with this ranch. The concept of placing these AUMs into "forage reserve" status was discussed with Mr. Bove. This opportunity also overlaps the Lower New Fork Basin.

- BLM / JIO Alkali Creek Watershed Assessment / Restoration Project. 233/234/240

The BLM proposed a potential restoration / Jonah Field mitigation project on Alkali Creek. This small, warm-water stream flows into the Green River approximately 2 miles below its confluence with the New Fork River. Assuming good permittee support and cooperation the project area and allotment has potential to become a forage reserve.

Management Recommendations

- Work with BLM, the 3 Bar Ranch owners, and consultant to cooperatively develop management strategies and habitat improvements in this area. Pursue development of a forage reserve.

Green River Middle Basin – 7GM (HUC 1404010104)

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage.

Objective: Determine angler success.

- Collect spot creel data. 520

Ten boat anglers were contacted on the Green River between Warren Bridge and the New Fork River confluence in 2006. Non-resident anglers made up a majority (80%) of those contacted, as is common in this area. The anglers interviewed caught 0.67 RBT/hour (0% harvest) 0.56 BNT/hour (0% harvest), and 0.83 MWF/hour (0% harvest), for a total of just over 2 fish/hour, exceeding the objective of 0.9-1.0 fish/hour.

Objective: Develop and maintain projects and habitats on and around the Huston Access area.

- Huston Access Project. 233/234/240

Primary development of this 30-acre acquisition, which provides for public hunting/ fishing and enhancement of riparian habitat, was completed in 2002.

Although maintenance work is still needed on the lower grade control sill in the developing channel, we determined that this work could be postponed until a more comprehensive habitat / restoration plan can be developed for this 1.5 mile reach of river. Mobilization of equipment would cost more than the actual maintenance work. Future opportunities involving other landowners include stabilization of additional cut-off channels and eroding banks, and construction of a more functional irrigation diversion structure for the Ada Ditch.

- Jerry Moore Cooperative Habitat Projects. 233/234/240

The Aquatic Habitat biologist continued to work closely with Moore, his consultant (John Dahlke), and lessee, to implement a successful grazing strategy on Moore's 120-acre riparian pasture in May. A stocking rate similar to 2005 had no noticeable impact on woody riparian vegetation. However, once again use by wildlife, presumably mostly moose, appeared very heavy. The cottonwood suckers in the four big game proof exclosures constructed in 2004 continued to show gains in height while unprotected suckers and seedlings remained suppressed from repeated browsing.

In August John Dahlke and the landowner completed the project to augment the water supply to the pond that was constructed in 2002. Seeding with a riparian mixture and planting willow cuttings along the disturbed area has been recommended.

Management Recommendations

- Continue to collect creel survey data when anglers are encountered.

- Develop plans and implement maintenance work on the lower grade control sill and continue to work cooperatively with the HAMS crew to monitor and implement other maintenance work as needed.

- Continue to work cooperatively with Moore, his consultant, and lessee to implement and monitor a riparian grazing strategy that allows mutual objectives to be met. Assist with planting willow cuttings in the area disturbed through construction of the water supply ditch.

Green River Upper Basin – 7GU (HUC 1404010101/02)

Goal: Provide a diverse, healthy, productive and sustainable ecosystem by eliminating threats from non-native salmonids and through the enhancement of habitats. Provide a non-native recreational fishery in all watersheds not managed for native fisheries.

Objective: Provide habitat protection and enhancement in the Upper Green River Basin.

- Habitat Protection. 540

Worked with private landowners, Green River Valley Land Trust and the Wyoming Stock Growers Agricultural Land Trust to establish conservation easements on the Green River corridor to protect migration corridors for big game, the Green River fishery and habitat for aquatic and terrestrial wildlife.

Prepared a letter of approval for Anselmi project in the vicinity of the Warren Bridge public fishing access area.

Objective: Monitor native aquatic species in the Upper Green River basin and evaluate potential restoration opportunities.

We were unable to complete work due to personnel shortages

Objective: Monitor the wild trout fishery and the survival of FHR stocked in the Upper Green River basin.

We were unable to complete work due to personnel shortages

Objective: Monitor relative survival of stocked fish in Dollar Lake.

- Fish Population Survey. 512

Dollar Lake: Dollar Lake is 27 acres with a maximum depth of 34 feet. The lake is primarily spring fed and is known to have partial winterkills. It is managed as a basic yield fishery and is a popular family fishery. The lake has been surveyed annually with EG or TS to collect trend data. Four TS were set on May 11 for 23.0 hours. There were a total of 3 anglers present on Dollar Lake on May 11, one of whom was observed catching 4 RBT in less than 1 hour. RBT, RSS, SPD, and MTS were captured in TS. RBT size and weight ranged from 10.7-13.5 in and 0.42-0.87 lbs (Table 7). Over-winter survival of RBT was evident. A total of 3,000 catchable ELR were stocked on May 19th and an additional 234 catchable (1.3 ELR/lb) ELR were stocked on June 28th.

Table 7. Summary results for Dollar Lake.

Year	Species/Gear	No.	CPUE	Mean Length (Inches)	Range Length (Inches)	Mean Weight (Pounds)	Range Weight (Pounds)
2004	RBT/FG	46	2.04	14.0	12.0-18.1	1.01	0.61-2.06
2005	RBT/TS	42	0.49	11.8	6.5-20.5	0.70	0.14-2.84
2006	RBT/TS	17	0.18	12.1	10.7-13.5	0.55	0.42-0.87

Objective: Determine angler success and their satisfaction with fishing.

We were unable to complete work due to personnel shortages

Management Recommendations

- Dollar Lake: Continue stocking 3,000 catchable RBT annually. Continue annual trend net surveys to evaluate winter survival. TS were effective this year and we will continue using this sampling year in future years.

- Continue to work with Carneys and other entities to establish conservation easements on the Green River corridor to protect migration corridors for big game, the Green River fishery and habitat for aquatic and terrestrial wildlife.

- Evaluate Anselmi project.

Horse Creek Basin - 7HO (HUC 1404010105)

Goal: To assure the long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminating threats from non-native salmonids, and enhancing habitats.

Objective: Ensure WRAC agreement stipulations are met.

- Habitat Protection. 540

No meetings with Forest Service regarding the WRAC were scheduled for this summer as anticipated.

Objective: Take advantage of the opportunity to rest treatments from livestock use in this area to implement watershed enhancement projects with an emphasis on aspen regeneration.

- Fish Habitat Inventory. 511

WHAM Level I assessments and inventories in the project area to identify and prioritize potential treatment sites and coordinate with the USFS to implement treatments was not completed.

Objective: Coordinate with the USFS during their on going BTNF planning process to allow prescribed natural fires to occur in this area to enhance vegetative communities.

- Interagency Coordination. 145

Discussion with USFS personnel and provide comments to this affect in the planning process did not occur.

Management Recommendations

- Ensure WRAC agreement stipulations are met

LaBarge Creek Basin - 7LA (HUC 1404010111)

Goal: Provide a diverse, healthy, productive and sustainable ecosystem within the LaBarge watershed project area by eliminating threats from non-native salmonids, through the enhancement of habitats and restoring connectivity in the drainage.

Objective: Establish a native fish assemblage in LaBarge watershed.

- CRC Restoration – August Piscicide Treatment. 610

Pretreatment work was completed in late July and early August. The crew completed discharge measurements at the tail end of each drip station on LaBarge Creek and its tributaries. Dye was run on some of the tributaries to determine drip station location. However on many of the tributaries with similar discharge as last year or on tributaries that required only 1 drip station, this task was eliminated. Drip stations were typically located at 2-hour dye flow intervals.

The treatment was completed from August 6-18. Liquid rotenone and rotenone sand mix were the piscicides used during the treatment (Table 8). In most cases the stream or stream section was treated at 1 ppm with 2-hour intervals between drip stations. However in the headwaters of LaBarge Creek we treated at 2 ppm at the first drip with 2-hour interval between drips. We had to retreat the upper section with 2 drips, each at 2 ppm and located 1 hour apart. All sentinel fish died after this application.

Table 8. The pounds and gallons of rotenone used for each stream during the 2006 LaBarge treatment.

Stream	Sand Mix (lbs)	Liquid Rotenone (gallons)
LaBarge Creek	388	39.98
Little Corral	50	3.04
Crystal	8	.33
Trail	5	.04

Little Clear	30	.58
Little Clear Creek Pond	26	.22
Clear	20	4.27
Spring #2	50	2.28
Cabin	23	.61
Road	17	0
Witherspoon	31	.07
Coyote Park	5	.13
Deer Gulch	4	.07
South LaBarge	70	7.21
Bald Hornet	3	.93
Shafer	17	.64
Indian	18	.28
Turkey	22	.06
Miscellaneous Tributaries	15	.09
Total	802	60.83

It was determined prior to beginning of this treatment that if any fish, including sentinel fish, were observed alive the morning after treatment we were going to retreat until all fish died. It was also determined that if we found any fish in any of the tributaries, dead or alive, we were going to retreat the tributary the following day. Even though this required us to be flexible with our schedule, increased our need for assistance, and required a few long days, it provided confidence that all fish were removed from these tributaries. The number of trout observed was considerably lower than the 2005 treatment (Table 9). Cutthroat trout were only found in two of the tributaries and RBT and BNT were only found in LaBarge Creek. Most of the RBT and BNT found in LaBarge Creek were greater than 8 inches and suspected to have passed over the barrier.

Table 9. Total number of dead fish collected for each stream during the 2006 treatment. Dead fish were identified to species when possible.

Stream	BKT	RBT	CRC	BNT	MTS	MSC	Total
LaBarge Creek	5	13	0	24	205	1	248
Little Corral	0	0	0	0	0	0	0
Crystal	1	0	0	0	0	0	1
Trail	0	0	0	0	0	5	5
Little Clear	2	0	0	0	0	0	2
Little Clear Pond	0	0	0	0	0	0	0
Clear	1	0	0	0	0	0	1
Spring #2	5	0	10	0	0	0	15
Cabin	0	0	0	0	0	0	0
Road	0	0	0	0	0	0	0
Witherspoon	8	0	0	0	0	0	8
Coyote Park	0	0	0	0	0	0	0
Deer Gulch	0	0	0	0	0	0	0
South LaBarge	0	0	19	0	0	0	19
Bald Hornet	0	0	0	0	0	0	0

Shafer	0	0	0	0	0	0	0
Indian	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0
Total	22	13	29	24	205	6	299
Trout Only 2006							88
Trout Only 2005							1214

A four-man crew ran the detoxification operation, which was located below the Turkey Creek confluence. Once the detoxification operation began the potassium permanganate continued to flow 24 hours a day. The daily application rate was based on a flow rate of 35 cfs. The crew successfully prevented rotenone from escaping outside the project area.

- CRC Restoration – October Piscicide Treatment. 610

The potential passage of fish through the diversion canal during the fall construction work prompted another small treatment in October. Pretreatment work was completed in October and treatment began on October 16. LaBarge Creek from Packsaddle Creek confluence downstream to barrier along with Bald Hornet and Turkey creeks were treated. Shafer and Indian creeks were not treated since the sheet-piling barriers at the confluences of these streams act as a barrier during low flows.

LaBarge Creek was treated at 2 ppm for 11 hours. Water temperature at the drip station ranged from 34 to 40 F. Discharge at the detoxification site on LaBarge Creek was 24 cfs. Two drip stations were located on Bald Hornet Creek. The upper station was treated at 2 ppm and the drip station located at two-hour flow downstream was treated at 1 ppm. Each drip was determined to run 11 hours. Water temperatures were the warmest in Bald Hornet (41 F). Turkey Creek was treated at 2 ppm for 11 hours. Rotenone sand mix was also applied to LaBarge Creek and the tributaries.

Clean up occurred on Wednesday October 16, 2006. All sentinel fish were dead. Nine BNT and one MWF were collected in LaBarge Creek from the barrier to Bald Hornet Creek confluence. No fish were observed in the tributaries. The BNT ranged from 3 to 11 inches.

A two-man crew ran the detoxification operation, which was located below the Turkey Creek confluence. The crew successfully prevented rotenone from entering private land.

- CRC Restoration – Little Clear Creek Pond. 512

One SG was set in Little Clear Creek pond to monitor effectiveness of the 2005 treatment. The net remained in the pond for 3 weeks. No fish were collected.

- CRC Restoration - Trap beaver and remove beaver dams. 610

Since beaver dams hinder the ability of piscicides to flow freely through the drainage and the dams create vast areas of backwater for fish to escape to during a treatment, we initiated beaver dam removal again this year. The U.S. Forest Service and Wyoming Game and Fish employees applied Kinepak to the beaver dams in July. This cleared the pathway and greatly decreased the amount of backwater, which increased the effectiveness of the treatment. The crew also trapped beaver for one week in July and during the first week of treatment. A total of 3 beaver were removed from the drainage and two were successfully transplanted to a small stream at the White Pine Ski area.

Objective: Provide effective fish migration barriers by conducting necessary modifications and maintenance.

- CRC Restoration – Barriers. 610

LaBarge Creek: On May 16, a total of 60 RBT (2.7-13.7 in) and 40 BNT (4.0-12.6 in) were captured in Big Fall Creek using BP, measured, weighed, given an AD clip, and released immediately downstream of the mainstem barrier on LaBarge Creek before peak flows had occurred. On June 7, a total of 21 BKT (3.9-9.3 in) and 1 RBT (6.0 in) were captured in Little Fall Creek using BP, measured, weighed, and given an AD clip before being released immediately downstream of the mainstem barrier on LaBarge Creek before peak flows had occurred. This was done in order to determine if TRT were able to ascend the barrier. Any fish recovered by clean up crews during chemical treatments above the barrier were checked for AD clips to determine whether fish were capable of ascending the barrier.

During the treatment we observed 3 adipose clipped trout upstream of the barrier. Two of the trout (1 RBT and 1 BNT) were located less than ½ mile upstream from the barrier and one 6 in brook trout was found in Witherspoon Creek.

The crew discussed ideas on how to improve the effectiveness and integrity of the LaBarge Creek fish migration barrier. A design was developed and work completed in 2006 through a contractor. Construction began on September 27, 2006 and the project was completed on November 3, 2006.

It was necessary for the contractors to divert the LaBarge Creek prior to maintenance work. To prevent fish from moving upstream in the diversion channel during barrier maintenance work, a weir was placed at the downstream end of the channel and potassium permanganate was released at 1 ppm for 24 hours. The weir and potassium permanganate remained in the diversion channel for 27 days. Water was released over the barrier on October 24. LaBarge Creek below the confluence of the diversion was electrofished to remove trout. As the project progressed and potassium permanganate saturated the streambed, the number of fish observed in this section of stream decreased to zero within 14 days (Table 10). Maintenance of the weir was tedious and at times we were unable to keep the weir debris free because of a pair of beaver working upstream. As the nights cooled down we also had problems with icing on the weir. The weir had to be cleaned of debris every hour for 24 hours when the debris buildup was the highest. No matter how diligently the crew worked we were unable to completely block fish migration for the first few days. Though maintenance of the weir was not easy from that point on, we felt confident that fish were not moving upstream after the first few days.

Table 10. Species, number and range of size (inches) for each species electrofished downstream from the diversion weir, September through October 2006.

Date	BNT	RBT	BKT	MWF
9/19/06	6 (3-7)	5 (5-8)	0	6 (3 -6)
9/26/06	10 (3-7)	2 (3-5)	1 (10)	0
9/27/06	4 (3-6)	2 (2-8)	0	0
9/29/06	23 (3-5)	2 (3)	0	5 (3)
10/01/06	10 (4-8)	0	0	0
10/06/06	32 (3-10)	0	0	0
10/07/06	3 (4)	0	0	0
10/08/06	2 (3-4)	0	0	0
10/09/06	0	0	0	0
10/12/06	0	0	0	0

The project included removal of the gabion and landing mat splash pad and replacement with a 22-foot concrete pad. The new pad removed the 1.5 to 2 foot pool that had developed below the barrier notch. A 4-foot concrete footer was placed on the downstream side of the pad, which should prevent scouring underneath the structure. The height of the notch was raised to 4.3 feet. The entire top of the gabion barrier and its face were concrete capped. Concrete wing walls were constructed on the downstream side of the barrier thus eliminating scouring at the corners, decreasing the opportunity for fish to key in on those weak points.

Though barrier retrofitting did not always go smoothly during the 38 days on site, the final product is an effective barrier. However the barrier notch now only passes 540 cfs. It was originally designed to pass 975 cfs (10 year event). The work in 2006 significantly improved the integrity and functionality of the barrier. Plans are in place to further improve the barrier in 2007 and 2008.

Objective: Restore connectivity in the drainage to provide unrestricted fish movement.

- <u>Barrier Removal</u>. 610

Rock Creek, tributary to LaBarge Creek, has two fish migration barriers. The upper barrier was planned for removal this summer. However work was not completed since the BLM range specialist left the BLM Pinedale Field Office.

Objective: Protect riparian habitat that has been impacted by livestock grazing.

- <u>Habitat Maintenance</u>. 440

<u>Nameless Creek:</u> Annual repairs were completed on the larger, lower, Nameless Creek exclosure in June. Unfortunately, maintenance work was not completed for the exclosure section above the water gap due to limited time and manpower, and the extensive amount of work necessary on the lower exclosure. Long-term maintenance and reconstruction needs were discussed with the Forest Service, but this concern has yet to be resolved.

Management Recommendations

- Continue monitoring mainstem barrier function, restore a native fish community by stocking CRC and native non-game species in the project area, monitor the success of the reintroduction, and remove all temporary barriers so the 58 stream miles are connected.

- Continue to coordinate with the USFS to improve land management practices throughout the LaBarge watershed

<u>Lower New Fork River Basin - 7LN (HUC 1404010203/06)</u>

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage and riparian habitat.

Objective: Monitor sport fish populations.

- <u>Electrofish the “Gas Wells” standardized station.</u> 512

Population estimates were calculated for sport fish in the New Fork River in the station located at the East Fork River confluence (this station is commonly known as the Gas Wells or Confluence station).

The estimated number of brown trout in 2006 was nearly identical to the number found in 2001, while their average length declined to a size closer to the historic average (Table 11). Nearly two thirds (63.6%) of the BNT population currently consists of fish <10” long, while only 3.9% are >=20” long. The number of RBT, SRC, and KOE continue to make up a very low percentage of the total number of trout in the reach. These populations continue to consist of mainly larger adults, as is indicated by the average sizes and the range of sizes collected (Table 11).

Table 11. Population estimates (number per mile) and average length of sport fish captured in the New Fork River (elevation 6900) below the confluence with the East Fork River from 1995 to 2006. Only fish that were at least 6 inches long were used in these calculations. The second number shown is the coefficient of variation, expressed as a percentage (CV%) or the range of lengths captured (Range). Species that were captured in numbers too low to calculate a population estimate are denoted with an asterisk. In 2006, a population estimate for all TRT minus the BNT estimate produced a total of 17 TRT per mile. This number was partitioned proportionally for each species caught to come up with the approximations shown.

Species	Number / Mile CV%				Average Length Range			
	1995	1998	2001	2006	1995	1998	2001	2006
BNT	192 31.3	218 19.1	302 16.1	305 7.2	10.2 6.0-21.5	9.5 6.0-21.5	13.8 6.1-24.3	10.0 6.0-25.2
RBT	25 303.0	12 481.2	5 63.7	~9 -	9.2 7.5-13.0	9.2 7.3-12.3	12.7 8.1-18.3	13.4 8.9-20.1
SRC	7 298.8	0	*	~1 -	13.0 7.8-18.2	-	17.3 16.5-18.1	13.2 13.0-13.4
KOE	*	*	*	~7 -	17.3 16.5-19.0	19.0 -	20.7 20.1-20.9	19.8 18.2-21.4
LAT	0	*	0	0	-	18.0 -	-	-

Samples were collected in 2001 and 2006 via a raft with fixed electrodes, while those collected in 1995 and 1998 were obtained with a throwing electrode. Coefficients of variation associated with the estimates obtained by each method show that the fixed electrodes consistently produce more precise estimates than those produced via the throwing electrodes.

The access points at both the upper and lower end of this sampling station have deteriorated considerably in the past year. Erosion along the road and in the notch in the bank used for boat access at the upper access point has produced large amounts of sediment and caused this area to become unusable for angers with low clearance vehicles and many types of trailers. Bank erosion has produced a high cut bank at the lower access point that eliminated boat access for all but the most determined anglers.

Objective: Determine angler success.

- Collect spot creel data. 520

Five bank anglers and 12 boat anglers were contacted on the section of the New Fork River located between Pine Creek and the East Fork River in 2006. Sublette County anglers made up 24% of the anglers interviewed, while residents of Utah and Idaho each made up 18% of the total. Residents from Teton and Sweetwater Counties and non-residents from Colorado, Montana, and Arkansas made up the remaining 41% of all anglers interviewed. Bank anglers interviewed only caught one BNT and one WHS, for a catch rate of 0.28 fish/hour (100% harvest). Boat anglers caught 0.25 RBT/hour (0% harvest), 0.66 BNT/hour (0% harvest), 0.05 RXC/hour (0% harvest), and 0.02 MWF/hour (0% harvest), for a total catch rate of 0.98fish/hour. The objective of 0.55 TRT/hour for all anglers was met.

Objective: Coordinate with cooperative landowners and land management agency personnel to enhance habitat for multiple species.

- Wyoming 3 Bar Ranch. 233/234/240

Habitat improvement and conservation opportunities as well as fisheries management issues were discussed with a representative (Mr. John Bove) for the new owners of the former Pete Olsen ("3 Bar") Ranch located at the confluence of the Green & New Fork rivers. A follow up letter summarizing our discussions with Mr. Bove was prepared and sent to him in December. Grazing permits in the Blue Rim Desert and Mesa common Allotments are associated with this ranch. The concept of placing these AUMs into "forage reserve" status was discussed with Mr. Bove. This opportunity also overlaps the Lower New Fork Basin.

- East Fork River (Wheeler Ranch) Habitat Enhancement Project. 233/234/240

Riparian and fisheries habitat improvement opportunities on the Gosar Family's "Wheeler Ranch" located on the East Fork River were evaluated and discussed with the landowners (Pete & Kevin Gosar) and Tom Wesche (HabiTech, Inc.). Mr. Wesche worked with Gosar's to prepare a detailed project proposal and specific plans for various opportunities discussed on site with them in September. A letter of support for this project was sent to the ACOE.

Management Recommendations

- Sample the Gas Wells station again in the fall of 2009 or 2010 with a raft and fixed electrodes to monitor trends in trout populations. Work with the U.S. Bureau of Land Management to stabilize banks and improve access for boat anglers. Continue to monitor angler success with "spot" creel interviews.

Muddy Creek Basin - 7MU (HUC 1404010109)

Goal: To assure the long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminating threats from non-native salmonids, and enhancing habitats.

Piney Creek Basin - 7PC (HUC 1404010108)

Goal: To assure the long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminating threats from non-native salmonids, and enhancing habitats. Provide a non-native recreational fishery in all watersheds not managed for native fisheries.

Objective: Enhance aquatic and terrestrial habitat in the North Piney watershed.

- Habitat Protection and Enhancement. 540

North Piney drainages: The grazing permitee in the Cottonwood, North Piney and Grey's River watersheds has agreed to waive his grazing permit for 2,726 AUMs of domestic sheep use back to the Bridger-Teton National Forest. Department personnel provided information to Trout Unlimited, other NGOs, the USFS, and the grazing permittee on the importance of these watersheds for aquatic and terrestrial wildlife. Cooperative efforts with the NGOs to raise funding for this project and coordination with the U.S. Forest Service are on going. Extensive coordination efforts resulted in a management agreement mutually acceptable to the USFS, permittee, and NGOs. The project includes 5 allotments, totaling 58,657 acres and will provide long-term protection to important CRC and SRC habitats.

Project implementation will ensure the long-term, sustainable health of vegetative communities and create a forage reserve to facilitate future treatments to benefit fish and wildlife habitats. Improvement of watershed/vegetative conditions in upland and riparian habitats on 58,657 acres throughout the project area will be accelerated. CRC will benefit from improved conditions in 99 miles of historical stream habitat. The 5,115-acre Lake Creek drainage including North Piney Lake (65-acre) will be closed to livestock grazing to protect this population of CRC, which provides an important component of the Wyoming Game and Fish Department's CRC restoration program as an egg source. Snake River cutthroat trout (SRC) habitat will be improved in 63 stream miles of portions of the Grey's River drainage within the Snake River Watershed. USFS will place the remaining 53,560 acres into Emergency Forage Reserve (i.e. grassbank) status, with strict language/terms/conditions under which this portion of the allotment complex could be grazed by domestic sheep. The acres below 9,700 feet may be available by 2008 for grazing 3 out of every 10 years pending data collection to evaluate the existing vegetative condition and ground cover. To complete the action the USFS will adopt a management plan for the forage reserve. The final vegetative criteria and monitoring methods, time frames, and locations will be cooperatively developed with TU, WGFD, the USFS, and other project proponents once the final payment is made.

As of September 2006, the first installment of $104,952 was provided to the permittee. At this time the US Forest Service and the permittee finalized the buy-out agreement to waive his permit back to the Bridger-Teton National Forest. Balance of payment $209,905 and project completion are anticipated by June 1, 2007, pending available funding.

Objective: Determine angler success.

- Creel Surveys. 520

North Piney Lake: A remote creel box was installed at the North Piney Lake trailhead to assess public fishing use and to assist with understanding how improved access to this lake will affect CRC population in North Piney Lake. This creel box was checked during the summer on July 18 with no creel cards returned. Biologists have communicated regularly with the Game Warden about changes in angler use on North Piney Lake. The Game Warden said he has observed a significant increase in angler use on North Piney Lake since the trail has been opened to ATV use.

Objective: Manage CRC brood stock in North Piney Lake.

- Fish Egg Collection. 712

North Piney Lake: Assisted the spawning crew with CRC egg collection on North Piney Lake. Successfully completed goal of spawning 30 CRC pairs. Fish appeared healthy and in good condition. Only 3 BKT captured (and permanently removed) from North Piney Lake. Many CRC and no BKT were collected by hook and line survey.

Objective: Inventory selected CRC populations throughout the watershed and identify purity and genetic diversity of populations.

- Fish Population Survey. 512

Crow Creek: The upper distribution of BKT in the main tributary of Crow Creek (not the mainstem) was determined on July 19. No CRC were collected or observed. The stream was electrofished by BP intermittently every 0.25 miles from the intersection of the ATV trail with Crow Creek upstream for 1.0 mile. Upstream of this point, the stream was electrofished continuously until the upper BKT distribution was determined. The last BKT (7.8 in) was captured immediately downstream of a natural barrier approximately 3,515 feet upstream from the intersection of the ATV trail with Crow Creek (12T E:534735, N:4726834, elevation = 8,760 ft; NAD27). We continued electrofishing approximately 985 ft upstream from where the last fish was captured with no new BKT discovered. BKT were present throughout this stream in very low numbers and were highly dispersed. The barrier consisted of a bedrock shelf in a high gradient stream section. The shelf was less than 1 m high with a very shallow and swift moving plunge pool area. The stream channel runs through a narrow walled V-shaped valley form that is primarily influenced by bedrock, boulders, and large woody debris. Numerous springs were present in the upper reaches that feed this stream.

Pinion Creek: The upper distribution of BKT in the Pinion and North Fork of Pinion creeks were determined on July 18. No CRC were collected or observed in either stream. Pinion Creek was electrofished by BP every 0.25 miles from the confluence of Pinion Creek and North Piney Creek upstream to the end of BKT distribution. A total of 4 BKT were counted, weighed, and measured in a small plunge pool below the natural barrier site (4.3, 4.8, 5.0, and 7.5 in). The last BKT were captured approximately 1.5 miles upstream of the confluence of Pinion Creek with the mainstem North Piney Creek (12T E:535207, N:4727040, elevation = 8,750 ft; NAD27). We continued electrofishing approximately 525 m upstream from the last fish captured with no new BKT discovered (about 1.8 miles upstream from the confluence with North Piney Creek). The natural barrier consists of wood and rock falls that measure 35 in from the plunge pool surface to the waterfall crest (close to 1 m). There was a very shallow plunge pool. We observed the largest BKT attempt to jump this falls (unsuccessfully). This stream channel runs through a narrow-walled V-shaped valley form and is primarily influenced by bedrock and large woody debris. Numerous springs feed into the main channel.

The North Fork of Pinion Creek was electrofished using BP to determine the upper BKT distribution. A total of 2 BKT (4.0 and 4.3 in) were captured in one pool downstream of a small natural waterfall (12T E:535549, N:4726389, elevation = 8,580 ft; NAD27). We electrofished from the confluence with Pinion Creek (mainstem) upstream approximately 300 ft to the upper BKT distribution. We continued electrofishing approximately 350 ft beyond this point with no more BKT discovered. The water flows became very limited beyond this point and there were numerous small waterfalls.

We were unable to locate, establish sample sites, and conduct 2-3 pass population estimates on 8 creeks (Apperson, Crow, Edwards, Lake, Lunch, North Piney, Pinion, and Roaring Fork creeks) due to personnel shortages.

We were unable to identify upper TRT distributions on 6 creeks (Apperson, Edwards, Lake, Lunch, North Piney, and Roaring Fork creeks) due to personnel shortages.

We were unable to identify locations of barriers to fish passage (natural and man made) due to personnel shortages.

- Fish Population Survey. 512

Roaring Fork Lakes: The Roaring Fork Lakes are a series of 6 total lakes ranging in size from less than 1-acre to about 5-acres in size. The two southernmost lakes apparently will go completely dry some years and are incapable of supporting fisheries (extreme headwaters of Roaring Fork Creek), so they were not sampled. The Game Warden has never heard anyone report catching fish in these lakes. Of the remaining 4 lakes to the north, the largest of these lakes (Roaring Fork Lake #1) is the highest elevation lake with a maximum depth of about 17 ft and was stocked with CRC in 1999. The remaining lakes are labeled #2-4 in order of highest to lowest elevation. Flowing water connections interconnect these lakes with no obvious barriers to fish movement. Water flows out of Roaring Fork Lake #4 and directly into the headwaters of North Piney Creek. These lakes are primarily spring/snow melt fed and are known to have partial winterkills, with angler reporting evidence of dead BKT in late spring/early summer after ice-off (Hovinga). Roaring Fork Lake #1 was stocked with CRC for one year, hoping a self-sustaining CRC population would establish. The remaining lakes are managed as wild BKT fisheries. Lakes #1-4 were stocked for 3 years in 1977-1979 with BKT. Three SG were set on July 20 for about 20 hours each in Roaring Fork Lake #1-3. No nets were set in Roaring Fork Lake #4. The only net that contained any fish was set in Lake #3. This net yielded a total of 18 BKT, which ranged in size from 9.5-16.6 in and weight from 0.40-2.07 lb. No other species was captured. The other lakes were fished (hook and line) for a total of about 4 hours by 6 anglers. No fish were caught in any other lake except Lake #3 (2 BKT captured, 10.0 and 11.0 in: Table 12). There was no evidence of fish life in any other lake (no fish rising). CRC were not found in any of the lakes. It seems strange that all the BKT were concentrated in one small lake (smallest in size of the four lakes) when there were no apparent barriers to movement from between all three lakes. There was a well-oxygenated cobble riffle just upstream of Lake #3 that connected Lake #2 with Lake #3. The fish appeared to be oriented toward the base of this riffle either feeding or utilizing available oxygen produced by the riffle action. Roaring Fork Lakes #1-4 appear to hold a very small population of BKT that appears to be habitat limited due to some unknown physical factor (i.e. water chemistry). These lakes may not be capable of sustaining any larger population size since partial winter kills have been reported consistently (Hovinga). These lakes will likely continue to hold only small numbers of BKT, however improved access to these lakes by ATV trails may lead to BKT population extirpation from these unique lakes should anglers over-harvest fish from a very small BKT population.

Table 12. Summary results for Roaring Fork Lake #3.

Year	Species/Gear	No.	CPUE	Mean Length (Inches)	Range Length (Inches)	Mean Weight (Pounds)	Range Weight (Pounds)
2006	BKT/SG	18	0.95	12.1	9.5-16.6	0.87	0.40-2.07

Management Recommendations

- Continue to monitor North Piney Lake CRC population and changes in angler use.

- Assist district Game Warden with North Piney Lake creel surveys on opening fishing day. Communicate regularly with district Game Warden about any observed changes in angler use in North Piney Lake and Roaring Fork Lakes.

- Continue to collect creel data from remote creel box near North Piney Lake trailhead. Determine if remote creel box is an effective means of collecting angler use information from North Piney Lake.

- Assist spawning crew with North Piney Lake spawning operations.

- Complete TRT population surveys in selected streams in the North Piney drainage including upper TRT distributions.

- Discuss whether or not there is a need for regulation changes on Roaring Fork Lakes to protect very small BKT population. Consider potential of restocking Roaring Fork Lakes with CRC.

Pine Creek Basin - 7PI (HUC 1404010202)

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage.

Objective: Determine if burbot are established in any of the lakes around Pinedale.

- Set trammel nets during the fall in likely habitat in Fremont Lake. 512

This work was not completed due to the early resignation of all seasonal employees.

Objective: Monitor the success of stocked RBT and KOE in Fremont Lake.

- Collect spot creel data when anglers are observed. 520

Eighteen shore anglers, 40 boat anglers, and 329 ice anglers were contacted at Fremont Lake in 2006. Anglers from Sublette County (46%), Sweetwater County (14%), and other locations in Wyoming (17%) comprised the majority of anglers. Idaho anglers also made up a significant percentage (14%) of the total. Shore anglers caught 0.08 LAT/hour (33% harvest), 0.08 BNT/hour (0% harvest), and 0.28 RBT/hour (82% harvest), exceeding the objective of 0.15 RBT/hour for shore anglers. Boat anglers caught 0.01RBT/hour (100% harvest), 0.10 KOE/hour (0% harvest), and 0.19 LAT/hour (38% harvest). The catch rate by boat anglers was far below the objective of 0.10/hour. Ice anglers caught 0.14 LAT/hour (14% harvest), 0.01 RBT/hour (23% harvest), and 0.003 BNT/hour (25% harvest). The harvest rate on LAT by ice fishermen may be unusually low, since nearly all of the data was collected during a tournament. Overall, anglers caught 0.15 LAT/hour, meeting the objectives of 0.15 LAT/hour.

Objective: Protect and enhance aquatic habitat in Pine Creek.

- Habitat Protection. 540

Releases from Fremont Lake were coordinated with the State Engineer's Office and all meetings of the Fremont Water User's Association were attended.

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage.

Objective: Monitor the success of stocked RBT in Little Soda Lake.

- Fish Population Survey. 512

Little Soda Lake: Little Soda Lake is 51.6 acres and is managed as a basic yield fishery. RBT catchables have been planted in Little Soda Lake since 1997. Typically, the lake provides an excellent RBT fishery and had become popular for local and out-of-state anglers. From 1992 – 2000, the lake did not experience fish kills. Since 2001, the lake experienced a partial or, more recently, total fish kills. We observed evidence of (at least) a partial winterkill on April 28, 2006 when 21 dead RBT (TL 15 - 19 in) were found after walking the entire perimeter of the lake. No signs of fish life were observed. Scavenger birds such as bald eagles, ravens, and red-tailed hawks were observed near or on the lake shore. On May 3, 2006, two SG were set for 24 hours and resulted in no TRT. One live SAL was recovered in the nets. The lake was restocked with 1,000 RBT on May 9th, 2006. Based on results from the past 4 years, Little Soda provides excellent summer growing conditions for RBT (Table 13), but RBT over-winter survival continues to be problematic.

Table 13. Summary results of gill net sets for Little Soda Lake 2002-2006.

Gear/Year	Month	Length Range Inches	Weight Range Pounds
SG/2002	May	No fish captured	No fish captured
SG/2002	October	14.8-16.5	1.13-2.25
SG/2003	May	No fish captured	No fish captured
SG/2003	October	12.5-16.5	0.98-1.94
SG/2004	April	No fish captured	No fish captured
SG/2004	October	14.3-17.8	1.33-2.25
SG/2005	May	No fish captured	No fish captured
SG/2005	October	12.7-17.3	1.12-2.62
SG/2006	May	No fish captured	No fish captured

Objective: Monitor conditions to help predict fish over winter survival at Little Soda Lake.

- Physical Assessment. 511

Little Soda Lake: Dissolved oxygen concentrations were measured in February 15, 2006. Oxygen concentrations in the lake were improved from the previous year, but are still well below concentrations necessary for RBT survival (Figure 1). Visual inspection of the lake in the summer and fall indicated that production of algae and aquatic macrophytes was very high in 2006. After a hole was drilled through the ice, a sulphurous smell was immediately evident.

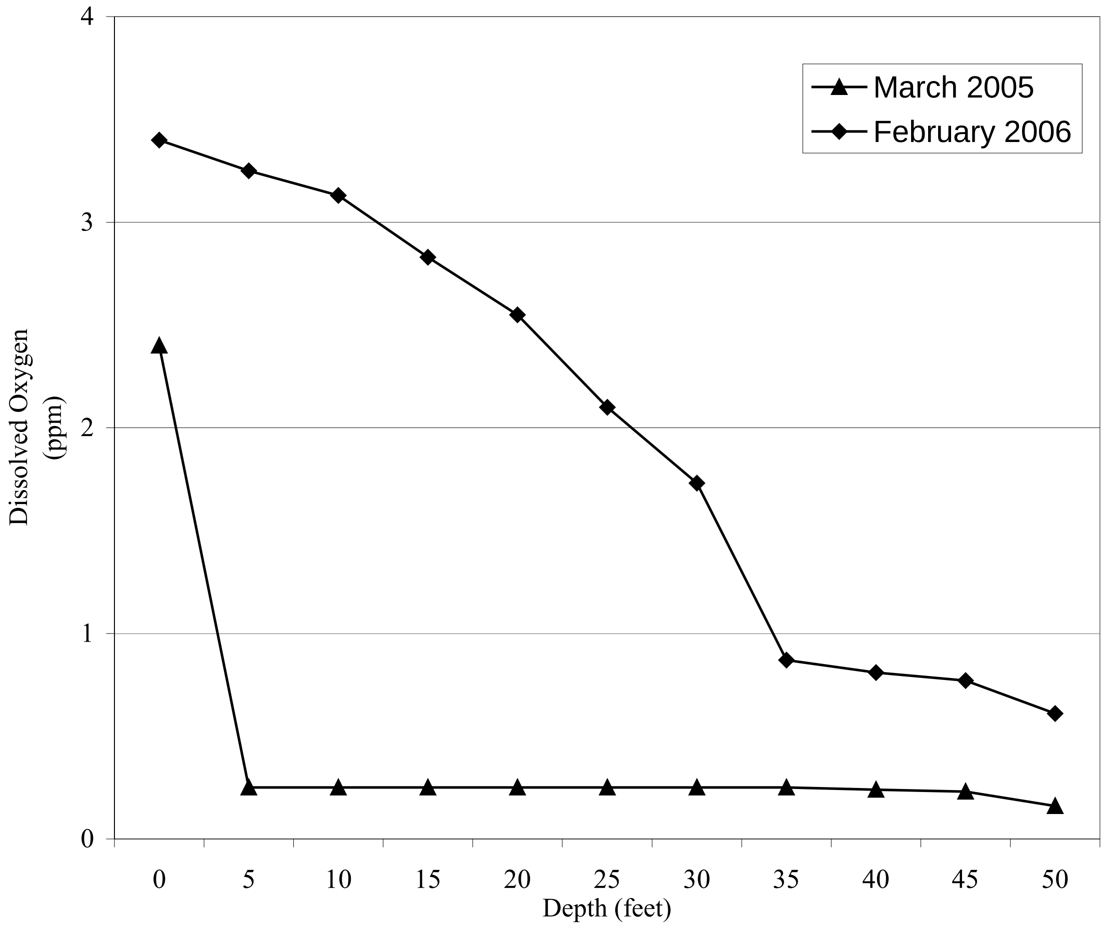

Figure 1. Dissolved oxygen concentrations (parts per million) from Little Soda Lake in February 15, 2006.

Objective: Monitor relative survival of stocked fish in CCC Pond.

- Fish Population Survey. 512

CCC Ponds: CCC pond is a 3-acre pond managed as a basic yield fishery. The water source is Fremont Lake and therefore various fish species may be present. A variety of salmonid species have been stocked in the CCC ponds since 1995, including RBT, BKT, GRL, KOE, and SRC. The lake is providing a good RBT fishery for families and children. On May 7, a concerned person told PE crew members that the water level was dangerously low and they were concerned about bird predation on fish in the shallow waters. The pond was sampled in May 8 to determine winter survival and trout growth. The water level on May 8 had dropped significantly (3-4 ft). The perimeter of the pond was walked and there was no sign of dead fish. A few fish were observed feeding on the surface of the pond. Dissolved oxygen levels and temperatures were measured in the deepest portion of the ponds. Both temperatures and dissolved oxygen levels were well within the range necessary to sustain TRT. Water levels had dropped due to a water filtration study conducted by USFS personnel. The inlet had been shut for an unknown period of time while water continued to drain from the outlet. This caused the water levels to drop significantly until the outlet was closed to prevent further water losses. Water levels continued to fall as water was lost due to evaporation and infiltration through the soil. On May 8, one SG was set for 22.5 hours and resulted in RBT (17), RSS (2), and MTS (16) catch. The size and weight range for RBT was 8.1-14.1 in and 0.19-0.90 lbs. Unlike the previous year, no BKT were captured. The lake was stocked once with 1,500 RBT on May 25.

Management Recommendations

- Little Soda Lake: Consider reducing stocking rate from 1,000 catchable RBT annually to 500 RBT annually and monitor RBT overwinter survival. Or, change regulations to increase harvest on RBT. Perhaps reducing the total number of RBT stocked or reducing RBT before winter will allow a smaller number of RBT to overwinter successfully.

- Continue to monitor dissolved oxygen concentrations to help predict the quality of fishing that can be expected.

- CCC Pond: Continue annual trend net survey to determine over-winter survival and growth. Monitor lake productivity to determine if RBT stocking rates should decrease. Stock a small number of BNT to allow opportunity to catch larger fish and prey on dense non-game species population. Continue using CCC ponds as site for annual Kid's Fishing Day. Continue Aquatic Education Workshops for local school district when possible. Continue working with CCC pond organizers to enhance fisheries benefits to the public.

- Complete the scheduled work on Fremont Lake to document whether BBT inhabit this water and monitor the sport fish community. Continue to collect creel survey data when anglers are encountered.

Pole Creek Basin - 7PO (HUC 1404010204)

Goal: Maintain a recreational fishery and conserve or enhance the native fish assemblage.

Objective: Determine life history characteristics of native species in Little Halfmoon Lake.

- Growth, movement, diet, and population size of RTC. 514

TS and ES were set in Little Halfmoon Lake during the late spring and early summer of 2006. The purpose of this work was to recapture RTC that had been marked in 2005 in order to gain a better understanding of the growth rates and age distribution of this lentic population. A secondary objective was to learn more about the FMS population. However, the time period sampled was selected based on the likelihood of catching RTC, rather than FMS. Data from 2005 suggested that FMS are most susceptible to TS earlier in the year, when water temperatures are cooler, and the fish are staging near the inlet in preparation for spawning. The first sampling date selected in 2006 should have been early enough to catch the end of the FMS spawning period, but catch rates were low (Table 14), and it appeared that the spawning period had passed. Catch rates for RTC increased when water temperatures were in the mid to upper 50^{o} range, and then tapered off as water temperatures reached the low 60^{o} range, as was the case in previous samples at Little Halfmoon and Burnt Lakes. Due to relatively low catch rates for both RTC and FMS, no attempt was made to calculate population estimates for these species.

Table 14. Catch per hour for species caught in TS at Little Halfmoon Lake during three periods of 2006.

SPECIES	Catch Per Hour		
	May 23 (48-49°F)	June 5 (54-58°F)	June 22 (61-64°F)
BNT	0.00 (0.00)	0.01 (0.02)	0.00 (0.00)
FMS	0.05 (0.10)	0.00 (0.00)	0.06 (0.06)
FXW	0.11 (0.10)	0.30 (0.25)	0.07 (0.06)
MSC	0.03 (0.03)	0.06 (0.05)	0.16 (0.16)
MTS	0.00 (0.00)	0.00 (0.00)	0.03 (0.05)
Unidentified Sucker	0.00 (0.00)	0.25 (0.51)	0.00 (0.00)
RBT	0.01 (0.03)	0.01 (0.02)	0.13 (0.25)
RSS	0.60 (1.02)	4.54 (5.09)	6.92 (9.27)
RTC	0.38 (0.34)	2.78 (1.54)	1.58 (1.18)
SPD	0.03 (0.03)	0.10 (0.07)	0.65 (0.48)
WHS	0.35 (0.53)	0.71 (1.01)	0.93 (0.94)

Floy tags were used to mark large RTC in both 2005 and 2006. These tags seem to be appropriate for use only on RTC larger than approximately 5 in. Therefore, only 54 fish were tagged in 2006. However, 5 of 47 RTC marked in 2005 were recaptured in 2006. These fish had been at large for approximately 1 year before being recaptured. Two fish (size range 4.8-5.0 in at time of tagging) grew 1.0 in in that period. Two slightly larger fish (both 6.8 in at time of tagging) grew 1.05 in in the same period. The largest recaptured fish (7.2 in at time of tagging) grew 1.3 in in 49 weeks. Although the length-frequency histogram for all RTC captured in 2005 and 2006 (Figure 2) is difficult to interpret, it appears that RTC grow approximately 1 in per year for the first 6-7 years of their life when the histogram is used in conjunction with the growth rates of the recaptured fish. Several RTC collected from Little Halfmoon Lake and Burnt Lake have died in the course of routine netting, and these mortalities have been preserved. Age analysis base on otoliths from these fish, in combination with the length-frequency histogram and additional growth data from recaptured fish, should provide a better characterization of the age distribution of lentic populations of this species. Unfortunately, Floy tags will not work on small RTC, so other gear (e.g., PIT tags) may be necessary to gain a better understanding of the growth rates for the smallest individuals.

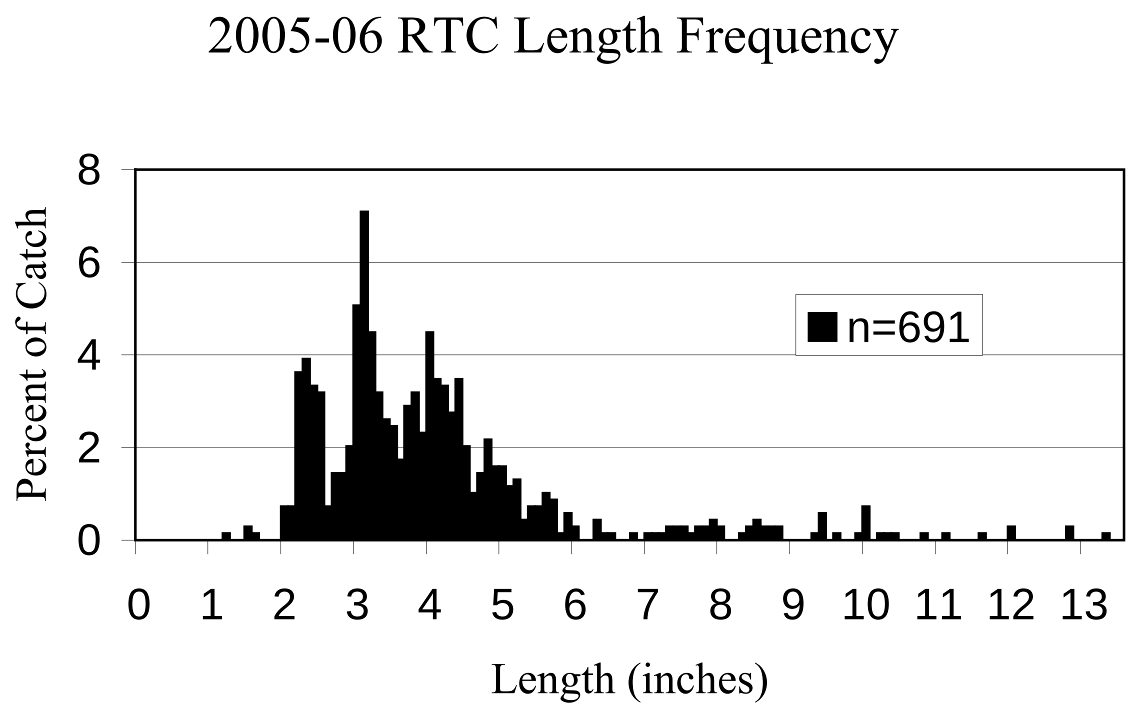

Figure 2. Length-frequency histogram of all RTC captured from Little Halfmoon Lake in 2005 and 2006.

Objective: Monitor the sport fish and non-game fish populations in Burnt Lake.

- Monitor non-game fish populations. 514

Personnel from the Wyoming Game and Fish Department's Customer Outreach and Publications Branch expressed interest in producing a video and audio interview on issues related to native fish species in the Pinedale Region. This inquiry resulted in an interview that was broadcast around the state by radio and television stations. Four TS, 1 FS and 1 ER were set in Burnt Lake on June 14, 2006 in order to catch RTC and FMS for use in the video portion of the interview. Most of the fish captured were only counted in order to reduce the amount of time needed to handle fish. Data from those fish that were measured is shown in Tables 14**,** 15**,** and 16.

Table 15. Number caught, average catch/hour, mean length (n; std) with ranges, mean weight (n; std) and mean relative weight (n; std) with ranges of fish caught with FS in Burnt Lake, June 14, 2006 (1 net, 17.25 hours).

Species	**#**	**CPUE**	**Mean Length (in)**	**Length Range (in)**	**Mean Weight (lbs)**	**Weight Range (lbs)**	**Mean Wr**	**Wr Range**
FMS	3	0.17	15 (3; 0.8)	14.1-15.5	1.2 (3; 0.1)	1.02-1.22	-	-
RBT	19	1.10	12.6 (8; 2.2)	8.5-15.1	0.7 (8; 0.3)	0.27-1.18	82.3	72-101

							(8; 8.4)	
RTC	2	0.12	11.4 (2; 0.1)	11.4-11.5	0.5 (2; 0)	0.45-0.52	-	-
WHS	1	0.06	9.8 (1;-)	-	0.3 (1;-)	-	81.6 (1;-)	-

Table 16. Number caught, average catch/hour (std), mean length (n; std) with ranges, mean weight (n; std) and mean relative weight (n; std) with ranges of fish caught with TS in Burnt Lake, June 14, 2006 (4 nets, 72.8 hours).

Species	#	CPUE	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)	Mean Wr	Wr Range
FMS	60	0.83 (0.47)	16 (9; 0.8)	14.7-17.2	1.3 (9; 0.2)	0.98-1.69	-	-
FXW	14	0.19 (0.11)	14.4 (2; 1.4)	13.4-15.4	1.1 (2; 0.3)	0.86-1.34	-	-
LAT	3	0.04 (0.13)	13.1 (4; 8.8)	0-18.3	1.4 (3; 0.2)	1.28-1.62	80.0 (3; 2)	78-82
RSS	582	8.07 (9.8)	4.6 (1;-)	-	0.02 (1;-)	-	-	-

Table 17. Number caught and average catch/hour for fish caught with ER in Burnt Lake, June14, 2006 (1 net, 18.1 hours).

Species	Number	CPUE
BKT	1	0.06
FMS	1	0.06
LAT	2	0.11
RSS	5	0.28

Objective: Determine if burbot are established in any of the lakes around Pinedale.

- Set trammel nets in Halfmoon Lake. 512

This work was done at Burnt Lake instead of Halfmoon Lake because an angler reported catching a fish that may have been a BBT in Fall Creek near the outlet of Burnt Lake. Three TM were set on 10/22/06 and one was set on 10/23/06. A water temperature of 46^{o} F was measured at three of the four sampling locations, so BBT, if present, should have been susceptible to capture in the nets. However, no BBT were captured. Data for species that were captured are shown in Table 18. None of the fish captured were of at least a “Quality” size, so values for RSD and Wr by size category were not calculated.

Table 18. Number caught, average catch/hour (std), mean length (n; std) with ranges, mean weight (n; std) and mean relative weight (n; std) with ranges of fish caught with TM in Burnt Lake, October 22-23, 2006 (4 nets, 88.2 hours).

Species	#	CPUE	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)	Mean Wr	Wr Range
FMS	93	1.05 (0.15)	16.4 (16; 2.2)	10.5-20.6	1.5 (16; 0.5)	0.38-2.4	-	-
FXW	21	0.25 (0.19)	14.3 (7; 2)	10.8-16.3	1 (7; 0.4)	0.48-1.4	-	-
LAT	29	0.33 (0.24)	16.1 (8; 2.9)	9.0-18.1	1.2 (8; 0.4)	0.28-1.55	78.4 (7; 4.4)	72-84
RBT	3	0.04 (0.05)	11.5 (2; 2.3)	9.9-13.1	0.6 (2; 0.3)	0.39-0.76	85.7 (2;10.3)	78-93
RTC	6	0.08 (0.12)	11.2 (5; 1.7)	8.8-12.8	0.5 (5; 0.2)	0.3-0.77	-	-
WHS	14	0.16 (0.15)	8.7 (2; 0.1)	8.6-8.8	0.3 (2; 0)	0.25-0.3	91.3 (2; 16.1)	80-103

Objective: Monitor the sport fish and non-game fish populations in the drainage.

- Public Contact. 160

A report of a fish kill in Sweeney Creek was received from an employee of the U.S. Bureau of Land Management in mid-August. An inspection later that month revealed that most of the stream had gone dry, so fish were concentrated in a series of small residual pools. Both live and dead BKT and CUT were found in some of these pools. Factors related to extremely low water levels (e.g., high temperatures or low dissolved oxygen concentration) most likely caused the mortalities noted by the reporting party.

- Monitor the sport fish populations – Bridger Wilderness Lakes. 512

Nelson Lake: Nelson Lake is a 20-acre lake located at 10,800 feet. The lake sits at the head of Nelson Creek. GDT were first stocked in 1961 and the lake has been managed as a GDT fishery. However recent drought conditions have eliminated most natural reproduction. The outlet of Nelson Lake (Nelson Creek) flows east through alpine tundra before finally reaching Tommy Lake. The first 25 yards of the creek has adequate spawning habitat. Beyond this point, the creek tumbles off a rocky slope with several natural falls before connecting with Tommy Lake. In August, the lake was disconnected from the outlet (2 feet below). GDT (4-9 inches) were observed in an isolated pool (10'x15') in the creek. Only 2 GDT (5.7 and 8.5 inches) in this pool were caught. Hailstorm and extreme high winds prevented any further sampling. A SG was set for 19.5 hours off the NW shoreline of Nelson Lake. No fish were collected.

In 1993, Nelson Lake was sampled with a SG for 5 hours and resulted in 10 GDT (10.5-18 inches). Numerous size groups were observed even though the lake was last stocked in 1983. Smaller GDT were also observed in Nelson Creek. However at this time, the outlet was connected with the lake.

Tommy Lake: This 20-acre lake was managed as a GDT fishery. In the 1970s the only species caught was GDT. By 1985 both GDT and BKT were found in the lake, though at this time the dominant species was still GDT. In 1993 and 2006, only BKT were caught and no GDT were observed in the lake in 2006. AN at Tommy Lake produced 6 BKT ranging from 5.2 -13.5 inches. Many BKT were observed along the shoreline and at the outlet. The outlet provides spawning habitat and therefore will continue to be managed as a wild trout fishery.

Don Lake: Don Lake is situated about 1 mile below Tommy Lake. Nelson Creek flows through Don Lake. Spawning habitat is available along the shoreline and at the inlet and outlet. The lake is managed as a BKT and LAT wild trout fishery. Historic data indicated that BKT was the dominant species but an occasional LAT and even a stray GDT had been caught. High winds and white caps on the lake prevented the set of a SG without jeopardizing the safety of the personnel. In August, AN resulted in 1 BKT (6 inches). However the poor weather conditions (wind and snow) were not conducive to AN. Small trout, assumed to be BKT, were observed in the inlet.

East Nelson Lake: East Nelson Lake lies just below Don Lake. There are no stocking records for this lake so it assumed that BKT drifted from Don Lake. Spawning habitat is not abundant so the fishery is either being sustained by recruitment from Don Lake or through the limited shoreline spawning. Two AN fishing for 1 hour caught 2 BKT (12.4 and 14.7 inches). Weather conditions were not conducive for setting a SG.

- Monitor the sport fish and native species populations and life history characteristics.

512/514/553

The standardized netting protocol historically used at Halfmoon Lake was to set 3 ER on three dates in the spring and early summer. In 2006, ES were used instead of ER so that the data collected would be more comparable to data from other regions in the state. In addition, ER were not catching many RBT, RTC, or small bodied non-game species, so FS and TS were set to determine if these species were rare or if the gear type used was not effective in catching all species present.

Data collected from ES, FS, and TS are presented in Tables 19, 20, and 21, respectively. ES worked well for both BNT and FMS, and produced the only LAT and MSC captured. ES proved to be far less effective at catching RBT than FS, while TS were the most efficient gear for catching RTC, MTS, and WHS. In addition, TS was the only gear that caught RSS or SPD, and tended to produce a wider range of sizes for a given species than the other gear types.

Table 19. Number caught, average catch/hour (std), mean length (n; std) with ranges, and mean weight (n; std) with ranges of fish caught in ES, Halfmoon Lake, June-July 2006 (9 nets, 172.08 hours).

Species	Number	Fish/hour	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)
BKT	2	0.01 (0.02)	6.5 (2; 0.2)	6.3-6.6	0.12 (2; 0.04)	0.09-0.15
BNT	25	0.15 (0.10)	16.0 (25; 3.0)	10.1-23.2	1.54 (25; 1.07)	0.32-5.22
FMS	88	0.53 (0.38)	18.3 (88; 2.3)	7.3-23.5	2.27 (86; 0.74)	0.15-4.3
FXW	53	0.32 (0.29)	12.0 (53; 3.4)	4.7-17.5	0.81 (53; 0.51)	0.09-2.42
LAT	38	0.22 (0.10)	17.79 (38; 3.3)	11.1-23.6	1.77 (38; 0.93)	0.40-4.60
MSC	1	0.01 (0.02)	4.9 (1;-)	4.9-4.9	-	-

MTS	5	0.03 (0.04)	6.8 (5; 0.4)	6.3-7.2	0.12 (5; 0.03)	0.09-0.16
RBT	17	0.10 (0.09)	11.6 (17; 4.1)	6.9-17.5	0.73 (17; 0.64)	0.10-1.82
RTC	19	0.11 (0.14)	8.4 (19; 1.4)	6.9-12.9	0.20 (19; 0.13)	0.08-0.69
WHS	40	0.25 (0.22)	9.0 (41; 2.8)	6.3-14.2	0.38 (40; 0.36)	0.09-1.13
TOTAL	288	1.72				

Table 20. Number caught, average catch/hour (std), mean length (n; std) with ranges, and mean weight (n; std) with ranges of fish caught in FS, Halfmoon Lake, June-July 2006 (6 nets, 108.53 hours).

Species	Number	Fish/hour	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)
BNT	2	0.02 (0.03)	9.7 (2; 1.8)	8.4-11	0.32 (2; 0.91)	0.18-0.45
FMS	3	0.03 (0.05)	19.1 (3; 3.7)	16.1-23.2	2.56 (3; 1.49)	1.46-4.26
RBT	35	0.32 (0.21)	11.7 (35; 3.5)	7.3-18.3	0.69 (34; 0.54)	0.12-1.91
RTC	7	0.06 (0.05)	7.71 (12; 1.0)	6.7-9.8	0.14 (12; 0.05)	0.10-0.24
WHS	1	0.01 (0.02)	7.0 (1; -)	-	0.15 (1; -)	-
TOTAL	48	0.44				

Table 21. Number, average catch/hour (std), mean length (n; std) with ranges, and mean weight (n; std) with ranges of fish caught in TS, Halfmoon Lake, June-July 2006 (12 nets, 270.14 hours).

Species	Number	Fish/hour	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)
BKT	4	0.02 (0.02)	5.1 (4; 0.4)	4.6-5.6	0.05 (3; 0.01)	0.40-0.60
FMS	54	0.20 (0.22)	16.5 (54; 3.6)	4.3-21.5	1.74 (34; 0.87)	0.18-3.75
FXW	113	0.42 (0.42)	10.39 (86; 3.4)	4.2-15.9	0.55 (67; 0.43)	0.04-1.58
MSC	12	0.07 (0.10)	3.3 (8; 1.1)	1.6-4.7	0.04 (3; 0.03)	0.02-0.07
MTS	32	0.09 (0.09)	5.0 (32; 0.8)	2.9-6.6	0.06 (18; 0.02)	0.02-0.10
RBT	13	0.11	6.8	3.3-18.0	0.28	0.03-1.51

		(0.20)	(13; 4.4)		(6; 0.60)	
RSS	81	1.03 (0.91)	2.7 (6; 0.9)	1.5-4.0	-	-
RTC	85	0.32 (0.32)	5.9 (85; 1.9)	3.3-12.8	0.09 (74; 0.14)	0.02-0.72
SPD	155	0.33 (0.26)	2.8 (34; 0.6)	1.4-5.2	0.03 (2; 0.01)	0.02-0.04
WHS	285	1.07 (0.96)	8.3 (227; 2.4)	2.1-15.2	0.28 (181; 0.23)	0.02-1.30
TOTAL	834	3.65				

The average length of nearly all species captured has increased since 2000, but the average relative weight has declined (Table 22). The main exception to this trend was for WHS. The differences noted in WHS were probably due to the fact that TS were more effective at catching WHS than ER, which was the gear type used in the past. The decline in relative weights of other species may be related to differences in densities or the effect of *Mysis*, both of which are discussed below.

Table 22. Average length, weight, and relative weight (Wr) for fish caught in all gear set in Halfmoon Lake in 2000 and 2006. The range of lengths caught is shown in parentheses following the average length. EG were used in 2000, while ES, FS, and TS were used in 2006.

Species	**Average Length (inches)**		**Average Weight (pounds)**		**Average Wr**	
	2000	**2006**	**2000**	**2006**	**2000**	**2006**
BKT	4.9 (4.9)	5.6 (4.6-6.6)	0.06 (0.06)	0.08 (0.04-0.15)	126.0 (126.0)	96.7 (66.3-126.7)
BNT	11.8 (7.1-16.2)	15.5 (8.4-23.2)	0.65 (011-1.46)	1.5 (0.18-5.22)	91.5 (70-153)	76.1 (62.8-89.2)
FMS	16.1 (10.1-22.0)	17.6 (4.3-23.5)	1.72 (0.40-3.45)	2.13 (0.15-4.30)	-	-
FXW	9.3 (8.6-10.0)	11.0 (4.2-17.5)	0.38 (0.32-0.43)	0.67 (0.04-2.42)	-	-
LAT	16.1 (10.5-30.6)	17.8 (11.1-23.6)	1.59 (0.35-9.30)	1.77 (0.40-0.60)	97.7 (70-130)	84.7 (66.4-116.4)
MSC	-	3.4 (1.6-4.9)	-	0.05 (0.02-0.09)	-	-
MTS	6.1 (5.1-7.0)	5.3 (2.9-7.2)	0.17 (0.19)	0.07 (0.02-0.16)	-	-
RBT	4.7 (4.7)	10.7 (3.3-18.3)	0.04 (0.04)	0.66 (0.03-1.91)	145 (145)	80.2 (60.2-112.6)
RSS	4.2 (4.0-4.3)	2.7 (1.5-4.0)	0.03 (0.03-0.05)	-	-	-
RTC	6.2 (4.6-8.5)	6.4 (3.3-12.9)	0.01 (0.02-0.18)	0.11 (0.02-0.72)	-	-

SPD	-	2.8 (1.4-5.2)	-	0.03 (0.02-0.04)	-	-
WHS	14.4 (6.6-19.2)	8.4 (2.1-15.2)	1.29 (0.13-4.18)	0.30 (0.02-1.30)	76.5 (52-135)	83.0 (43.9-143.2)

No "Trophy" fish were caught in Halfmoon Lake. BNT were the only game fish captured that had any individuals that were in the "Preferred" or "Memorable" size categories (Table 23). Relatively few of the LAT and RBT captured were of even a "Quality" size, and none of the BKT captured were of the "Stock" size. In addition to this paucity of larger fish, the relative weights for all sizes of game fish were below average (Table 24). The introduced *Mysis* population in Halfmoon Lake preys upon the zooplankton species that are used by the game fish community and probably drives down both the size and condition of all other zooplanktivores.

Table 23. Traditional relative stock density (RSD) for BKT, BNT, LAT, and RBT captured in Halfmoon Lake during 2006. Stock size (S), quality size (Q), preferred size (P), memorable size (M), and trophy size (T) are defined as 8, 12, 16, 20, and 24 inches for BKT and BNT, 12, 20, 26, 31, and 39 inches for LAT, and 10, 16, 20, 26, and 31 inches for RBT, and 6, 10, 13, 16, and 20 inches for WHS.

Species	**n≥ S**	**RSD-Q**	**RSD-P**	**RSD-M**	**RSD-T**
BKT	0	0	0	0	0
BNT	27	89	44	7	0
LAT	36	28	0	0	0
RBT	34	35	0	0	0
WHS	237	29	8	0	0

Table 24. Mean relative weights (n; std) with ranges for all fish and by length category (n; std) for fish captured with FS, ER, and TS in Halfmoon Lake during 2006. Stock (S), quality (Q), preferred (P), memorable (M), and trophy (T) are the lengths defined for use with Relative Stock Density.

Species	**Avg. Wr**	**Range**	**S-Q**	**Q-P**	**P-M**	**M-T**
BKT	96.7 (5; 25.3)	66.3-126.7	-	-	-	-
BNT	76.1 (27; 6.5)	62.8-89.2	79.7 (3; 2.9)	76.0 (12; 4.6)	73.6 (10; 8.1)	83.9 (2; 7.0)
LAT	84.7 (38; 10.0)	66.4-116.4	85.4 (26; 8.1)	79.9 (10; 9.3)	-	-
RBT	80.2 (52; 11.2)	60.2-112.6	75.9 (32; 7.0)	76.1 (12; 7.0)	-	-
WHS	83.0 (217; 11.2)	43.9-143.2	82.2 (138; 10.9)	87.8 (16; 5.4)	-	-

A comparison of the gear types that were most similar between the 2000 (ER) and 2006 (ES) sampling events shows that catch rates for many species have remained fairly consistent (Table 25). Notable exceptions are increases in the catch of FMS, FXW, RBT, and WHS. The increase in RBT is encouraging, since the number (~8,000), strain (ELR), and size (4.0-5.1 in) of fish stocked has remained relatively steady since the last netting sample. The increase in FMS catch is also encouraging at first glance, but deeper analysis reveals that this species may be in peril. First, the number of WHS has also increased, and this species readily hybridizes with FMS. This situation is obviously occurring in Halfmoon Lake, as the catch rate of FXW has also increased dramatically since 2000. In addition, the average size of FMS has increased since 2000 (Table 22). This is likely due to a lack of recruitment caused by extensive hybridization with WHS (Figure 3). If this issue is not addressed soon, the remaining adult FMS will likely reach the normal end of their lifespan and not be replaced by younger fish, causing the extirpation of this population. Three FMS and 1 FXW marked in Little Halfmoon Lake were captured in Halfmoon Lake in 2006, so these populations are obviously not isolated. FMS in that lake would also likely meet the same fate.

Table 25. Comparison of the number of fish caught per hour (std) in sinking gill nets at Halfmoon Lake in 2000 and 2006.

Species	2000	2006
BKT	0.01 (0.01)	0.01 (0.02)
BNT	0.10 (0.03)	0.15 (0.10)
FMS	0.03 (0.02)	0.53 (0.38)
FXW	0.01 (0.02)	0.32 (0.29)
LAT	0.21 (0.08)	0.22 (0.10)
MSC	0 (-)	0.01 (0.02)
MTS	0.03 (0.02)	0.03 (0.04)
RBT	0.01 (0.01)	0.10 (0.09)
RSS	0.02 (0.02)	0 (-)
RTC	0.07 (0.03)	0.11 (0.14)
WHS	0.12 (0.09)	0.25 (0.22)

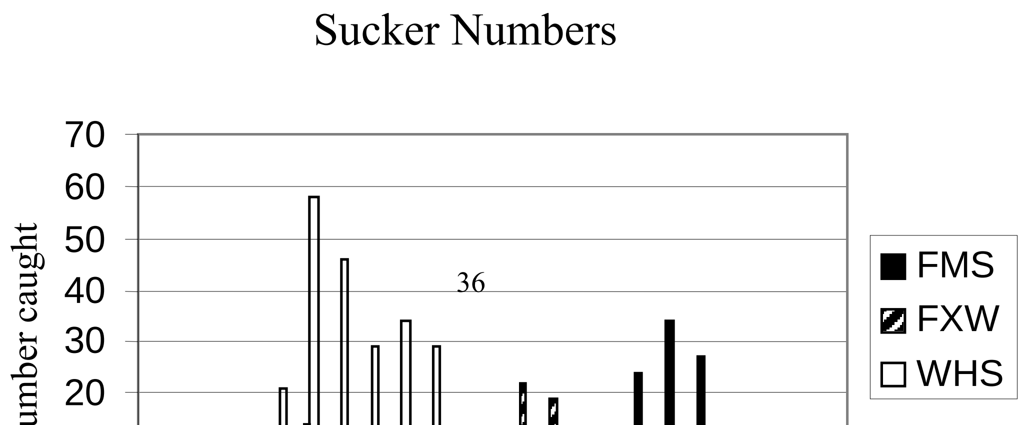

Figure 3. Length-frequency histogram for FMS, FXW, and WHS captured from Halfmoon Lake in 2006.

RTC appear to be doing relatively well in Halfmoon Lake. While the size at sexual maturity has not been well defined in the lakes around Pinedale, WY, several ripe fish as small as 6 in have been captured, and one 5.2 in mature male was captured in Halfmoon Lake. Therefore, while a majority of the RTC captured in Halfmoon Lake were probably adults, some reproduction is likely taking place (Figure 4). Juvenile RTC are even more common in Little Halfmoon Lake, and one marked fish moved from that lake to Halfmoon Lake in 2005. Therefore, recruitment of RTC from Little Halfmoon Lake is likely supplementing the population in Halfmoon Lake.

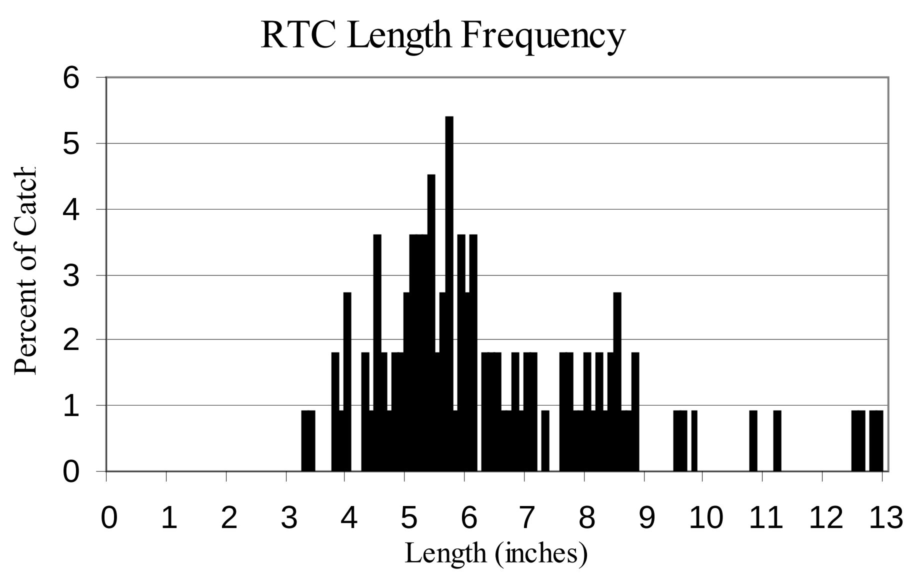

Figure 4. Length-frequency histogram for RTC captured from Halfmoon Lake in 2006.

Objective: Determine angler success.

- Collect "spot" creel data when anglers are seen. 520

Two shore anglers, 18 ice anglers, and 39 boat anglers were contacted at Halfmoon Lake in 2006. Anglers from Sublette County (78%), Sweetwater County (14%), and other locations in Wyoming (5%) comprised the majority of anglers. Shore anglers caught 0.14 LAT/hour (0% harvest). Ice anglers caught 0.3 LAT/hour (100% harvest) and 1.63 RBT/hour (53% harvest). Boat anglers caught 0.26 LAT/hour (15% harvest) and 0.02RBT/hour (0% harvest). Overall, anglers caught 0.21 LAT/hour and 0.34 RBT/hour, meeting the objectives of 0.2 LAT/hour and 0.2 RBT/hour.

Management Recommendations

- Continue to monitor waters affected by drought.

- Continue to set TM in lakes to document the spread of BBT.

- Continue to use ES, FS, and TS in Halfmoon Lake in order to get a more complete picture of the status of the fish community.

- Continue to study growth rates of RTC in Little Halfmoon Lake using mark/recapture data and age analysis of otoliths. Monitor the sport fish communities in lakes every 3 to 4 years.

- Consider implementing a WHS and FXW removal program in Halfmoon Lake to protect the remaining FMS population.

- Continue to monitor angler success with "spot" creel interviews.

- Complete fish population surveys in Pole Creek drainage, Bridger Wilderness.

Goal: Conserve and enhance GRL populations in Meadow Lake as a Department brood source and a quality recreational fishery.

Objective: Monitor GRL populations and habitat conditions to secure long-term persistence and health of populations as the Department brood source and value as a popular family fishery.

- Life History/Ecology Investigations. 553

Meadow Lake: During the 2006 spawning operation the average length of 30 mature male and female GRL was 15.5 and 15.3 in. The size of mature GRL has continued to increase from 1995 to the present (Table 26). A management goal for the lake is to maintain an average adult length of 13.5 inches, which is currently well above objective.

Table 26. Mean length of mature GRL in Meadow Lake from 1992 to 2001.

Year	Sample Size	Mean Length Males	Mean Length Females
1992	30	13.9	13.2
1993	30	14.0	13.8

1994	30	14.2	13.8
1995	30	11.0	11.1
1996	30	11.2	11.0
1997	30	12.6	12.1
1998	30	13.3	12.9
1999	30	13.8	13.6
2000	30	14.1	13.9
2001	30	14.3	14.0
2002	30	N/A	N/A
2003	30	15.5	14.9
2004	30	N/A	N/A
2005	30	15.4	14.8
2006	30	15.5	15.3

Meadow Lake water levels rose slightly from the previous year, but still appear to be below average. Natural reproduction is limited in Meadow Lake because of minimal flow in the inlet and low water also increases GRL vulnerability to avian predators. The spawning crew did not have any problems meeting GRL egg requests, but numbers should continue to be monitored closely until drought conditions change to assure GRL populations persist. The spawning crew did not rake GRL spawning redds from the Meadow Lake inlet upstream to the spawning trap so that some natural recruitment will occur.

- Physical Assessment. 511

Meadow Lake: Dissolved oxygen concentrations were measured in April 2006. Due to poor ice conditions, we were unable to take dissolved oxygen readings from the exact location as 2005. Oxygen concentrations in the lake appeared low for GRL survival (Figure 5). However, this is the second year collecting dissolved oxygen data for the lake, so comparisons from previous years are not available. We observed no evidence of winterkill after walking the shoreline immediately after ice off in early May.

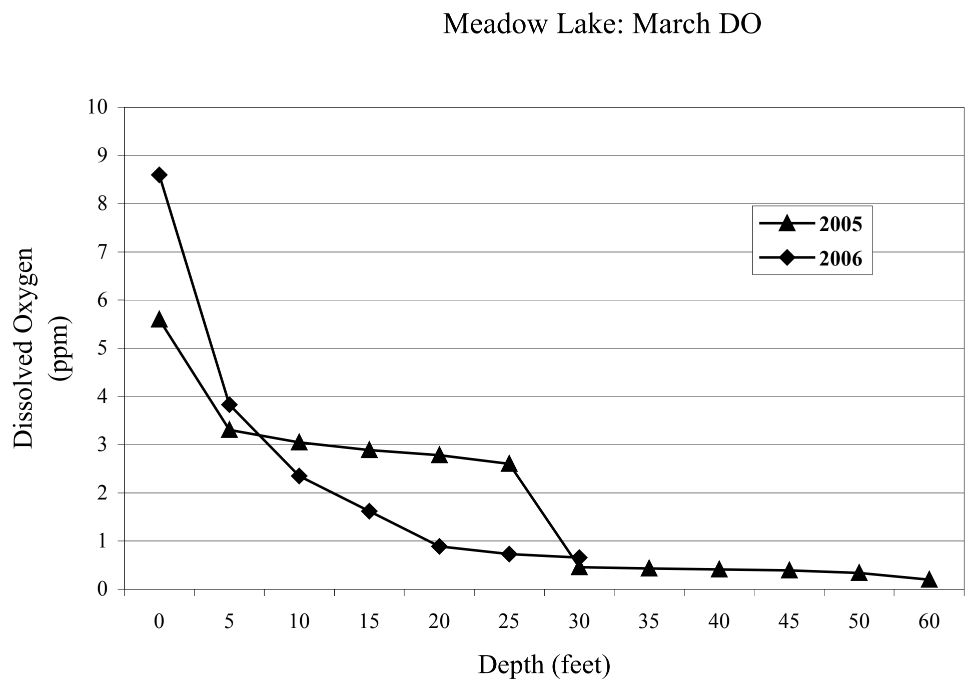

Figure 5. Dissolved oxygen concentrations (parts per million) from Meadow Lake in April, 2006.

Management Recommendations

- Meadow Lake: Continue monitoring mature GRL populations. Maintain Meadow Lake as Department's GRL brood. Maintain average mature GRL at 13.5 in. Allow some GRL to spawn naturally in stream below spawning trap. This will increase population numbers and help maintain the mature GRL population at 6,000-8,000. Maintain GRL catch rates of 1.0 GRL/hour. Continue to monitor dissolved oxygen concentrations in March at original location from 2005 and look for dead fish when the ice breaks up to help predict whether winterkill conditions occurred.

Smiths Fork Basin - 7SF (HUC 1601010202)

Goal: Assure long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminate threats from non-native salmonids, and enhance habitats as opportunities arise, while providing for a recreational fishery.

Objective: Establish baseline datasets for BRC, LSC, and herptile populations.

- Sample streams with little or no historic data. 512

Two new electrofishing stations were established on Grade Creek in a cooperative effort with Trout Unlimited. The purpose of this work was to document the species composition and calculate population estimates for the existing fish community. The lower end of Grade Creek is currently completely dewatered by an irrigation diversion. Trout Unlimited has secured permission from the owner of the water right and obtained funding to alter the diversion in anticipation of returning enough water to the historic channel to reconnect Grade Creek to the Smiths Fork River.

The lower electrofishing station was established just above the road crossing on Grade Creek (elevation of 6,763 feet above sea level). This station produced estimates of 129 BRC/mile, 35 BKT/mile, and 164 sculpins/mile (species not determined) (Table 27). The upper electrofishing station was established upstream in a canyon bound reach (elevation of 6,960 feet above sea level). This area had fewer BRC (86/mile) but far larger numbers of BKT (326/mile or 172/mile if YOY were excluded) and sculpins (2922/mile) than the lower reach.

Table 27. Population estimates (number per mile) and average length of fish captured in two electrofishing stations located on Grade Creek (elevations 6,763 and 6,960). The second number shown is the coefficient of variation, expressed as a percentage (CV%) or the range of lengths captured (Range). The estimates shown exclude YOY BKT.

Species	Number / Mile CV%		Average Length Range	
	Elevation 6,763	Elevation 6,960	Elevation 6,763	Elevation 6,960
BKT	35 37.0	172 12.8	6.2 5.4-6.9	6.3 2.4-10.1
BRC	129 25.9	86 19.9	5.4 3.9-8.2	5.5 4.4-7.4
Sculpins	164 21.4	2922 104.9	no data	no data

A limited number of surveys were conducted in an effort to document the distribution of herptiles. These efforts produced 2 wandering garter snakes in the West Fork of the Smiths Fork drainage near the confluence with Trespass Creek and adult BCF from abandoned beaver ponds in the Dry Fork of the Smiths Fork drainage. No amphibians or reptiles were found in the Smiths Fork drainage near the confluence with Hobble Creek.

Objective: Monitor populations of BRC and other native species.

- Collect fisheries data at established sampling sites. 512

A concerned sportsman reported a large fish kill in the lower Smiths Fork River in mid-August. Inquiry into this event revealed that mass mortality of radio-tagged BRC from two different studies also occurred at that time. Over 40% of tagged fish from one study died in a short period of time; losses of fish from the other study could not be accurately quantified, but losses of a similar magnitude were noted. Two canals were removing over 84% of the water from the lower Smiths Fork at that time, so the mortalities were likely related to low water (e.g., high temperate or low dissolved oxygen concentration).

- Collect genetic samples at Lake Alice. 553

Genetic samples at the standardized location as well as a site near the inlet of Lake Alice to determine if there are different strains was not completed due to the resignation of one biologist, early resignation of all seasonal help, and higher priority work that needed to be completed in the fall.

Objective: Monitor habitats used by BRC and other native species.

- Collect and summarize habitat data. 510

Jerry Kirk's: Habitat measurement taken on Jerry Kirk's property were not summarized and additional detailed habitat measurements on the Smiths Fork River were not collected since similar work in the Thomas Fork drainage took longer than anticipated.

Management Recommendations

- Continue to cooperate with Trout Unlimited to return flow to the natural channel of Grade Creek. Repeat population estimates at established stations on Grade Creek within 5 years.

- Continue to monitor instream flow sections and work with landowners to maintain or improve habitat conditions in order to ensure that suitable habitat remains for the native fish community.

Thomas Fork Basin - 7TF (HUC 1601010203)

Goal: Assure long-term conservation of native aquatic species by providing a diverse, healthy, productive and sustainable ecosystem, eliminate threats from non-native salmonids, and enhance habitats, while providing for a recreational fishery.

Objective: Establish baseline datasets for BRC and LSC populations.

- Bonneville Reservoir. 540

Landowners in the Salt Basin drainage (a tributary of Giraffe Creek) proposed to build a small on-channel reservoir (to be named Bonneville Reservoir) for fish habitat and aesthetic value. Wyoming Game and Fish Department personnel expressed concerns about how this project would affect BRC and other native species, but the U.S. Army Corps of Engineers issued a permit for this reservoir anyway. A site visit was scheduled with the landowners in hopes of convincing them that the existing habitat supported fish that would be harmed by the new reservoir. BP gear was used to shock a large portion of the stream above the site of the proposed reservoir. This work produced 3 BRC (3.9-8.5 in), 27 sculpins (likely MSC) and 108 SPD. The landowners were surprised that the stream held any fish, and they agreed to consider our suggestions of doing other types of habitat work instead of constructing a reservoir. However, unsubstantiated reports suggest that the reservoir may have been constructed in December 2006.

Objective: Monitor habitats used by BRC and other native species.

- Collect detailed habitat measurements on Coal Creek and Little Muddy Creek. 511

Habitat measurements were collected following protocols outlined by Dave Rosgen in his Levels I-III River Short Courses. One site was located near the upper end of the livestock exclosure on Coal Creek, another was located just upstream from the exclosure, and another was located below the exclosure near the confluence with Little Muddy Creek. All of these stations were located in similar stream types, valley types, etc., so the data will be useful in determining how the stream channel is responding to the protection that is provided by the exclosure. Another station was located on Huff Creek below another exclosure, but this station has a different stream type, so the data won't be directly comparable. Data collected included longitudinal and cross-section profiles, stream type variables (e.g., entrenchment, slope, width/depth ratio, bed material, sinuosity, etc.), and bank stability variables (e.g., near bank stress, bank erosion hazard index, and Phankuch Channel Stability Evaluation). Permanent channel cross-sections were established and bank pins were installed on one cut bank at each site so that changes in habitat can be reassessed in the future. Cursory analysis showed that the channel inside the grazing exclosure is narrower, deeper, and has more riparian vegetation than the sites outside of the exclosure, as was expected. Complete analyses will be summarized in another document.

Population estimates on the fish community were made at each site where habitat measurements were collected (Table 28). This work showed that the station inside the livestock exclosure held the highest density of BRC, as well as moderate densities of sculpins and SPD. LND and MTS were very numerous in the station located below the exclosure, but BRC were rare at this site. SPD were most numerous in the station above the exclosure. This station also held fish that appeared to be LSC (these may have been misidentified SPD) and RSS, and these species were not found at any of the other stations. The Huff Creek site held an extremely high density of sculpins, but other species were relatively rare. Population estimates were also made in 2004 at a station that overlapped the one done on Huff Creek in 2006. Interestingly, that work produced no BRC and fewer than half the number of sculpins estimated in 2006. No differences in habitat between the sampling periods were noted that would explain this dramatic increase in fish numbers.

Table 28. Fish population estimates (number per mile and pounds per mile) for 3 stations on Coal Creek and 1 on Huff Creek. The stations on Coal Creek were in similar stream and valley types, while the station on Huff Creek was in a steeper area. Weights could not be collected on the station above the Coal Creek exclosure due to equipment problems. LSC may have been actually been misidentified SPD.

Species	Coal Creek Above Exclosure		Coal Creek In Exclosure		Coal Creek Below Exclosure		Huff Creek Below Exclosure	
	#/mile	lb/acre	#/mile	lb/mile	#/mile	lb/ acre	#/mile	lb/ acre
BRC	200	-	263	68.1	96	24.7	126	8.1
LND	0	0	26	0.5	1567	-	0	0
LSC	11	-	0	0	0	-	0	0
Sculpins	0	0	0	0	0	-	12,508	149.1
MTS	710	-	478	22.1	1466	111.0	50	3.19
RSS	11	-	0	0	0	0	0	0
SPD	631	-	428	2.8	186	2.3	50	0.46

Objective: Protect and enhance habitats on a watershed scale throughout the basin as opportunities arise.

- <u>BLM Smiths Fork Allotment</u>. 540/140

The Pinedale Aquatic Habitat biologist participated in the BLM's scheduled fall monitoring tour of the Smiths Fork Allotment on September 13, 2006. Livestock impacts in portions of the allotment visited during the tour appeared to be similar to the past years, or slightly lower. However, upper Coal and East Coal Creeks, in the Coal/Dipper pasture, were used very heavily. Numerous cattle were not removed after the planned use period so regrowth was kept grazed off. Use on willows in these areas was also very high, but was not measured. Also, utilization levels were very high near an upland water development at a spring source located between Coal and East Coal Creeks. The exclosure fence protecting the spring and tank valve had not been properly maintained. Therefore, the spring source area was severely trampled as well as the area where the tank had overflowed. The Little Muddy Creek Riparian exclosure fence appeared to have been intentionally cut at the northwest corner. Repairs were made following the tour.

Data collected on September 13, 2006 in cooperation with the BLM and permittees is available in the BLM's Annual Smiths Fork Allotment Monitoring Report for 2006. Results of this monitoring effort documented that use levels on willows exceeded the 40% use criteria in the AMP.

The exclosures on Coal and Huff Creeks were both maintained and functioned properly in 2006.

The results of these evaluations, monitoring methods used, and the need to better maintain fences and exclosures as well as other issues and concerns were discussed with the BLM Assistant Manager following the tour. While current BLM management has demonstrated a commitment to resolving these on-going concerns, numerous problems remain in this important area.

- <u>Huff Creek Head Cut Control and Exclosure Project</u>. 234

Following numerous attempts to schedule a visit with the private landowners on Huff Creek where the lower of two head cuts are active, verbal permission was gained in October to stabilize the head cut site and construct an exclosure to protect the area from cattle grazing. With assistance from the Casper regional Aquatic Habitat Biologist, a preliminary project plan has been prepared and will be presented to the landowner for final approval before submitting it to the COE for a 404 permit.

Assuming permit approval and availability of an adequate labor force, stabilization work and exclosure construction are expected to be completed on both Huff Creek head cuts in 2007.

- <u>Raymond Watershed Projects</u>. 234

For the second year in a row very little evidence of livestock use was observed in the Raymond watershed when the area was visited on September 12, 2007. Livestock management and use levels in this watershed will continue to be monitored to evaluate if additional fencing is necessary and evaluate long-term recovery of this important watershed.

- <u>Coordination with BLM</u>. 140

Continue to work with the BLM to monitor livestock impacts in the Smiths Fork Allotment, including the Raymond watershed, and work to develop solutions to identified problems. Both cattle and sheep were documented in the wrong pastures on several occasions during the summer of 2006. Information on the number and location of the trespass animals were recorded and sent to the U.S. Bureau of Land Management. Personnel from that agency made site visits because of that information, and trespass notices were served in some instances. It is unlikely that this action would have been taken if the Wyoming Game and Fish Department had not documented the trespass situations.

- <u>Plant willow cuttings</u>. 234

<u>Huff, Coal, Little Muddy, and Klein creeks:</u> Approximately 1,000 willow cuttings were planted in the upper end of the livestock exclosure on Coal Creek. Cuttings were also planted throughout the small exclosure on Klein Creek. Each cutting was dipped in rooting hormone before planting, unlike previous efforts when no hormone was used. Survival at the end of the summer was not quantified, but casual observation indicated much better success than has been noted in the past. In addition, nearly all cuttings produced some leaves, and some produced new stems up to 6 inches long.

Management Recommendations

- Continue to use rooting hormone when planting willow cuttings in the Thomas Fork drainage livestock exclosures.

- Collect data for population estimates for all fish species in the Giraffe Creek drainage within the next 2 years.

- Continue efforts to work cooperatively with the BLM, permittees, landowners, and NGOs to evaluate and improve management actions to ensure watershed health and recovery of riparian communities to more natural conditions.

- Continue to monitor management and use levels in the Raymond watershed at least once annually to determine if the fence extension project is necessary.

- Construct exclosures and implement Huff Creek head cut control structures.

Upper New Fork River Basin - 7UN (HUC 1404010201)

Goal: Maintain a KOE population in New Fork Lakes that will produce enough eggs to meet stocking requests, while conserving or enhancing the native fish assemblage and providing a recreational fishery composed of a variety of salmonids species.

Objective: Manage the KOE brood stock in New Fork Lakes.

- Sample zooplankton populations, water clarity, temperature profiles, and dissolved oxygen concentrations monthly during the open water season. 553

Zooplankton populations, water clarity, temperature profiles, and dissolved oxygen concentrations were sampled at least once per month in both the upper and lower lakes from late May though September. The purpose of this work was to gain a better understanding of the factors that are affecting the number of KOE that return to the spawning trap as mature adults. Qualitatively, the water appeared to be clearer than in 2004 or 2005, and other parameters appeared to be suitable to support a KOE population. All samples and data were transferred to the Aquatic Assessment Crew for processing and analysis. In addition, the Aquatic Assessment Crew used HY gear and mesh curtains to enumerate the KOE population. That crew was also in charge of data analysis, and results can be found in their portion of the annual progress report.

- Monitor KOE spawning run. 712

The KOE spawning run started about two weeks later than normal, but more fish were collected than in either of the two prior years. The number of mature KOE caught in the WE in 2006 rebounded substantially from the all-time low number captured in 2005 (Table 29). The number of males collect and their average size were very close to the objectives for this brood stock (4,000 males that average 11 in total length). The sex ratio also appeared to be less skewed than in 2005, but this value could only be estimated, due to inconsistencies in data recording by the spawning crew during the 2006 spawning season. The average lengths of both sexes declined in comparison to the previous year, but were close to the historical averages. Over 664,000 eggs were taken from 1,525 females, which was far better than the 97,000 eggs collected from 150 females in 2005. Thirty pairs of mature KOE were released above the trap to allow limited natural recruitment to occur. In addition to these fish, a substantial number of small adults were able to squeeze through the wings on the WE. Therefore, natural reproduction may have been higher than desired in 2006.

Table 29. Characteristics of KOE caught in the spawning trap above New Fork Lake. Data shown includes mean length, number of males captured, number of ripe females captured, and the sex ratio. Data marked with an asterisk are minimum estimates because all fish were not counted.

Year	Mean length (in)		Number of		Sex Ratio
	Males	Females	Males	Ripe Females	(Male/Female)
1992	9.8	9.5	8,275	3,090	2.68
1993	9.5	9.3	4,980	2,134	2.33
1994	11.1	10.8	6,676	4,533	1.47
1995	11.7	11.0	1,595	923	1.73
1996	13.1	13.2	1,977	1,212	1.63
1997	11.2	11.2	3,496	1,091	3.20
1998	11.6	12.2	2,426	619	3.92
1999	12.3	12.5	2,321	791	2.93
2000	11.9	12.4	3,399	1,053	3.23
2001	10.6	10.8	11,583	2,603	4.45
2002	10.7	9.8	5,351	1,254	4.27
2003	12.7	12.0	5,230	2,942	1.78
2004	14.4	13.9	990	380	2.61
2005	12.2	13.4	741	158	4.70
2006	10.9	12.0	*4,267	1525	*2.80

Objective: Monitor sport fish populations.

- Fish Population Survey. 512

Duck Creek: An angler called on May 19 concerned about the water levels of Duck Creek and how the potential low oxygen concentration and high water temperatures would impact the BNT population. After making several phone calls to the State Engineers Office in Big Piney and to landowners on Duck Creek it was found that a landowner upstream shut down most of the flow to this creek while he completed maintenance work on his irrigation diversion. The water remained low for approximately one week until maintenance work was completed. During that week the fish population and habitat conditions of Duck Creek were assessed to determine if dissolved oxygen and water temperatures were in fact detrimental and if a salvage operation would be necessary. Electrofishing 274 feet of Duck Creek on May 26 found 13 BNT, 3 MSC, 21 WHS, 9 SPD and 3 RRS. Not all fish shocked were collected but enough to realize that both game and nongame fish were present. The BNT ranged from 4.3-22 inches. No dead fish were observed in the main channel or side channels of Duck Creek. The continuous flow in Duck Creek appeared to be able to maintain dissolved oxygen levels and water temperatures for fish survival. Water temperature at 0900 was 52 F, which is within the range for trout survival. Deep pools of 3-4 feet were still available on the main channel. Though water was low in Duck Creek it appeared to be able to support trout for this short period. Two days after the survey Duck Creek was back to "normal" summer flows.

- Monitor RBT stocked in New Fork Lakes. 512

Gill nets were set in the standard locations during the month of June. ES (Table 30) were the most effective at catching LAT and RSS, and had the highest catch rates overall. In addition, MTS and MWF were captured in ES but not in FS (Table 31). However, the only RTC was captured in a FS. Few of the sport fish captured were of even the "Preferred" size (Table 32), and the relative weights of nearly all size classes were below average (Table 33), as is common in the lakes around Pinedale, WY.

Table 30. Number caught, average catch/hour (std), mean length (n; std) with ranges, and mean weight (n; std) with ranges of fish caught in ES, New Fork Lakes, June 2006 (9 nets, 162.72 hours).

Species	Number	Fish/hour	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)
BKT	11	0.07 (0.15)	11.9 (11; 1.8)	8.3-14.6	0.68 (11; 0.26)	0.21-1.11
KOE	14	0.06 (0.07)	8.5 (14; 1.9)	6.7-13.1	0.23 (14; 0.18)	0.10-0.74
LAT	22	0.13 (0.13)	18.6 (22; 4.3)	10.3-28.0	2.23 (22; 1.84)	0.31-8.10
MTS	16	0.11 (0.09)	6.9 (16; 0.7)	4.6-8.0	0.13 (16; 0.04)	0.02-0.20
MWF	37	0.22 (0.26)	12.4 (37; 2.6)	8.0-17.5	1.10 (37; 1.88)	0.15-11.75
RBT	60	0.36 (0.33)	12.4 (60; 2.2)	7.0-17.1	0.84 (59; 1.87)	0.13-1.88
RSS	16	0.10 (0.27)	4.1 (16; 0.22)	3.8-4.5	0.03 (2; 0.01)	0.02-0.03
TOTAL	176	1.05				

Table 31. Number caught, average catch/hour (std), mean length (n; std) with ranges, and mean weight (n; std) with ranges of fish caught in FS, New Fork Lakes, June 2006 (6 nets, 112.25 hours).

Species	Number	Fish/hour	Mean Length (in)	Length Range (in)	Mean Weight (lbs)	Weight Range (lbs)
BKT	6	0.05 (0.07)	11.4 (6; 1.4)	9.2-13.5	0.58 (6; 0.24)	0.27-0.99
KOE	7	0.09 (0.12)	7.4 (7; 1.1)	6.7-9.8	0.13 (7; 0.07)	0.10-0.28
LAT	1	0.01 (0.02)	18.4 (1;-)	1 fish	1.71 (1;-)	1 fish
RBT	33	0.29 (0.33)	10.3 (33; 1.3)	7.3-13.8	0.40 (33; 0.14)	0.13-0.84
RSS	1	0.01 (0.02)	5.3 (1;-)	1 fish	0.08 (1;-)	1 fish
RTC	1	0.01 (0.02)	7.0 (1;-)	1 fish	0.13 (1;-)	1 fish
TOTAL	49	0.46				

Table 32. Traditional relative stock density (RSD) for BKT, KOE, LAT, and RBT captured in New Fork Lakes during 2006. Stock size (S), quality size (Q), preferred size (P), memorable size (M), and trophy size (T) are defined as 8, 12, 16, 20, and 24 inches for BKT, 8, 10, 12, 16, and 20 inches for KOE, 12, 20, 26, 31, and 39 inches for LAT, and 10, 16, 20, 26, and 31 inches for RBT.

Species	n≥ S	RSD-Q	RSD-P	RSD-M	RSD-T
BKT	17	47	0	0	0
KOE	8	25	13	0	0
LAT	21	38	5	0	0
RBT	76	5	0	0	0

Table 33. Mean relative weights (n; std) with ranges for all fish and by length category (n; std) for sport fish captured with FS and ER in New Fork Lakes during 2006. Stock (S), quality (Q), preferred (P), memorable (M), and trophy (T) are the lengths defined for use with Relative Stock Density.

Species	Avg. Wr	Range	S-Q	Q-P	P-M	M-T
BKT	89.6 (17; 6.5)	81.1-102.2	89.7 (9; 7.0)	89.1 (8; 6.3)	-	-
KOE	83.6 (21; 8.6)	66.0-102.6	88.5 (6; 8.6)	84.3 (1;-)	86.8 (1;-)	-
LAT	82.2 (21; 8.2)	57.1-97.5	78.5 (13; 7.6)	86.9 (7; 3.6)	97.5 (1;-)	-
RBT	80.4 (92; 7.64)	62.3-99.2	79.8 (71; 7.7)	80.1 (4; 7.5)	-	-

A comparison of the catch rates and size structure of the fish captured since 2002 are shown in Table 34. The average length of both LAT and RBT have both increased each year since 2002, even though the number of RBT stocked annually has remained near 15,000 and the number of KOE stocked has remained near 25,000. The trends shown by ES are often contradictory to those shown by FS, so data on catch rates are difficult to interpret. Overall, it appears that no drastic changes in the fish community have occurred since 2002.

Table 34. Average length and catch rates (CPUE) for fish caught in ES and FS set in New Fork Lake from 2002-2006. The range of lengths caught is shown in parentheses following the average length, and the catch rate for FS follows the catch rate for ER in 2003 and 2006; FS were not used in 2002.

Species	Average Length (inches)			CPUE (fish per hour)		
	2002	2003	2006	2002	2003	2006
BKT	9.7 (5.1-15.2)	8.5 (6.6-16.5)	11.7 (8.3-14.6)	0.12 -	0.17 0.13	0.07 0.05
KOE	9.9 (8.4-12.2)	10.7 (9.8-12.0)	8.2 (6.7-13.1)	0.12 -	0.02 0.18	0.06 0.07
LAT	15.0 (10.8-29.3)	16.3 (6.4-30.7)	18.6 (10.3-28.0)	0.37 -	0.18 0.04	0.13 0.01
MTS	6.3 (4.5-7.1)	6.9 (6.2-7.8)	6.9 (4.6-8.0)	0.11 -	0.18 0.08	0.11 0.00
MWF	12.1 (8.0-16.5)	13.5 (9.3-17.1)	12.4 (8.0-17.5)	0.33 -	0.24 0.03	0.23 0.00
RBT	9.9 (7.2-16.2)	11.0 (6.6-18.5)	11.7 (7.0-17.1)	0.44 -	0.17 0.56	0.36 0.29
RSS	4.0 (3.5-4.5)	-	4.1 (3.8-5.3)	0.20 -	0.00 0.00	0.10 0.01
RTC	-	7.9 (1 fish)	7.0 (1 fish)	0.00 -	<0.01 0.00	0.00 0.01

Objective: Determine angler success.

- Collect spot creel data. 520

Twelve shore anglers, 12 ice anglers, and 2 boat anglers were contacted at New Fork Lake in 2006. Anglers from Sublette County (36.4%), Teton County (27%), and other locations in Wyoming (27%) comprised the majority of those interviewed. Shore anglers caught 0.66 RBT/hour (67% harvest), meeting the objective of 0.5 RBT/hour. Boat anglers caught 3 RBT/hour (100% harvest) and 1 BKT/hour (100% harvest). Unfortunately, the objective of 0.1 LAT/hour for boat anglers could not be evaluated properly, due to the low number of angler contacts. Ice anglers caught 0.25 LAT/hour (100% harvest) and 0.19 RBT/hour (85% harvest), for a total of 0.44 fish/hour.

Goal: Maintain BNT and BKT populations in Soda Lake that will produce enough eggs to meet stocking requests and provide a recreational fishery.

Objective: Determine the number of BNT and BKT surviving at the end of the angling season.

- Population estimates on BNT and BKT. 512

Population estimates were calculated for BNT and BKT in 2006 after the fishing season was complete. Trout handled by the Spawning Crew were marked with a hole punch, and TS were used to complete mark-recapture estimates. The Spawning Crew did not measure the fish they marked, so an assumption was made that the fish they marked had the same size distribution as the fish captured in the recapture effort. In addition to adult fish, they captured large numbers of immature BKT. This has not happened in previous years. Some of these fish were also marked, but tallied separately, so a separate estimate could be made for immature BKT. Population estimates showed that the number of BNT (636; 95% CI of 423-1047) was less than half of the number found in 2005 (1,342; 95% CI of 861-2,294), and this number is the lowest ever recorded. The number of adult BKT (476; 95% CI of 430-545) was about the same as the number found in 2005 (389; 95% CI of 330-540), which was also an all time low (Figure 6). The number of juvenile BKT is only slightly higher (1,259; 95% CI of 1,171-1,369). The estimated 3,717 pounds of mature TRT biomass in the lake is far below the management objective of 32,500 pounds. This condition is likely to continue or even get worse until the water level increases. As of mid-February 2007, the snow water equivalent for the area around Soda Lake was at 75% of normal, so the water level is likely to drop further in 2007.

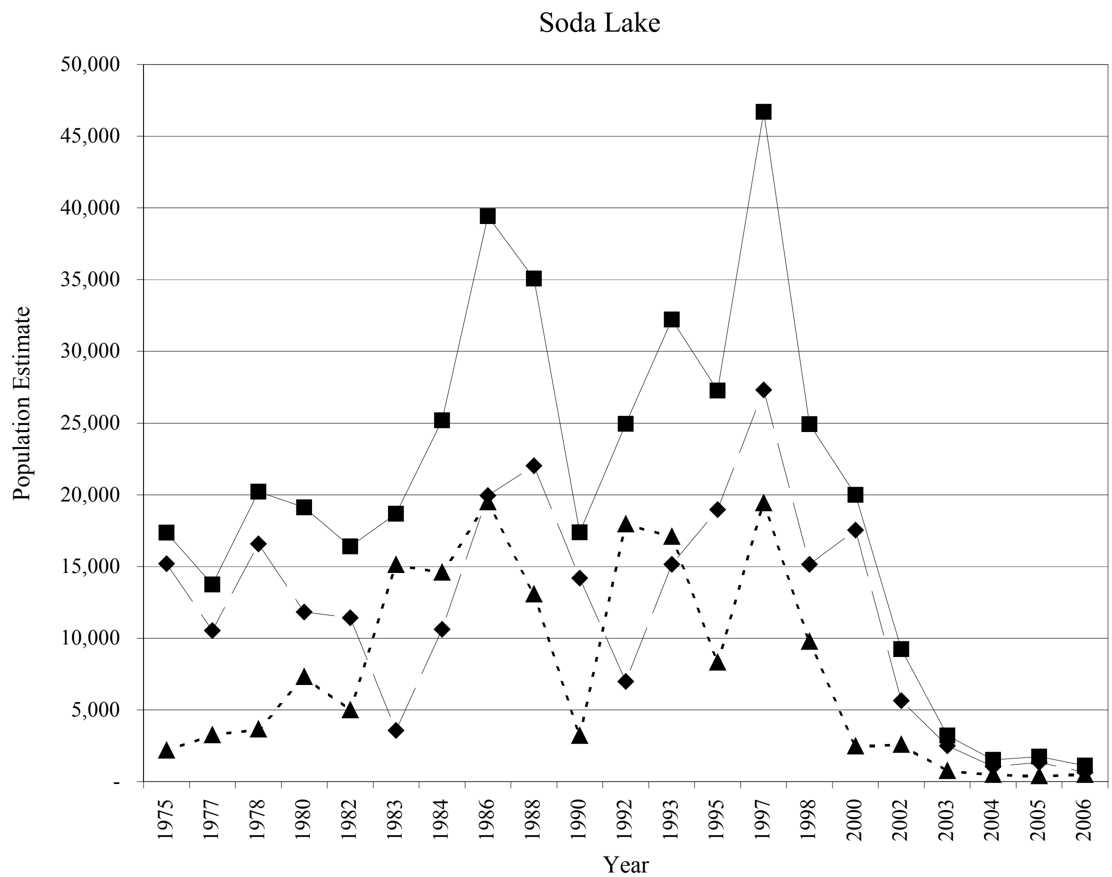

Figure 6. Population estimates for BNT, BKT, and both species combined in Soda Lake from 1975 through 2006. Note that the X-axis only includes years in which population estimates were calculated.

Objective: Monitor conditions to help predict fishing and egg collection success at Soda Lake.

- <u>Monitor spring and fall BKT stocking</u>. 577

Mean lengths of BNT and BKT were measured at Soda Lake during spawning operations in 2006, as has been done in the past. The average length of mature BNT captured in 2000 was 15.8 in, but was up to 21.1 in in 2004, dropped to 20.4 in in 2005, and increased again in 2006 to 21.4 in. The average length of mature BKT also increased. They averaged 14.9 in long in 2006, compared to 12.9 in in 2001, 13.6 in in 2003, 13.5 in in 2004, and 13.6 in in 2005.

Trends in size structure of TRT in Soda Lake that began several years ago continued in 2006 (Table 35). The RSD for BKT began to shift toward larger individuals in 2002, and the values calculated in 2006 for the largest size categories were the highest ever observed. The RSD for BNT also began to shift toward larger individuals in 2001. This shift slowed in 2003, but the BNT size structure measured in 2006 shows that this population is again shifting further toward larger individuals. Currently, the percentage of "Trophy" sized fish is quite substantial. These trends are probably related to poor survival of the small fish that are stocked each year, which is in turn likely a product of extended drought. In addition, the poor survival of younger fish is likely reducing competition in the lake, allowing the remaining individuals to grow larger than they did in the past. This is supported by the high relative weights achieved by all sizes classes except trophy BNT (Table 36). Even that size category would have been closer to normal if one abnormally light female (Wr=51) would have been excluded from the analysis; it is likely that fish had dropped some or all of her eggs before being weighed, thus affecting the calculation.

Table 35. Traditional relative stock density (RSD) for adult BKT and BNT captured in the Soda Lake spawning operation during the fall of 1997-2005. Quality size (Q), preferred size (P), memorable size (M), and trophy size (T) for both species are defined as 12, 16, 20, and 24 inches respectively.

Species	Relative Stock Density	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BKT	RSD-Q	70	77	93	68	82	81	91	94	91	93
	RSD-P	0	0	3	2	0	5	10	7	7	30
	RSD-M	0	0	0	0	0	0	0	0	0	0
	RSD-T	0	0	0	0	0	0	0	0	0	0
BNT	RSD-Q	98	100	98	98	100	98	100	100	100	100
	RSD-P	68	80	73	50	71	89	97	98	96	97
	RSD-M	3	0	3	0	2	8	37	75	65	73
	RSD-T	0	0	0	0	0	0	1	7	7	17

Table 36. Mean relative weights (n; std) with ranges for by length category (n; std) for adult fish captured with during the spawning operation at Soda Lake during 2006. Stock (S), quality (Q), preferred (P), memorable (M), and trophy (T) are the lengths defined for use with Relative Stock Density.

Species	Avg. Wr	Range	S-Q	Q-P	P-M	M-T	T
BKT	117.3 (28; 9.9)	97.7-136.9	99.5 (2; 3.0)	116.8 (19; 9.2)	122.9 (7; 8.3)	-	-
BNT	95.7 (30; 13.8)	51.1-129.3	-	107.5 (1;-)	107.0 (7; 12.5)	95.7 (17; 8.1)	77.8 (5; 15.3)

Stocking of both BNT and BKT historically was done in the spring at Soda Lake. This strategy was altered in 2002 because of poor survival of the stocked fish. The new strategy called for stocking one half of each species in the spring, and the other half in the fall. Those stocked in the fall were fin clipped in order to help determine if fish stocked in one season survived better than those stocked in the other season. Although the number of fish handled for this analysis was small, it appears that BNT stocked in the spring survive better than those stocked in the fall, while BKT stocked in the fall survive better than those stocked in the spring.

Clinical signs of Furunculosis were visually identified on one BNT collected by the Spawning Crew in October. The Wyoming Game & Fish Department Lab confirmed the presence of the bacteria in Soda Lake several times in the past, so samples were not collected this year to confirm the field diagnosis.

- Monitor dissolved oxygen concentrations throughout the winter. 553

Dissolved oxygen concentrations measured in February 2006 were unusually high in comparison to data collected in the previous five previous winters (Figure 7). Dissolved oxygen concentrations had decreased by the following month to levels closer to those found most (Figure 8). The reason(s) for these dramatic changes in dissolved oxygen concentrations is unknown and deserves further study.

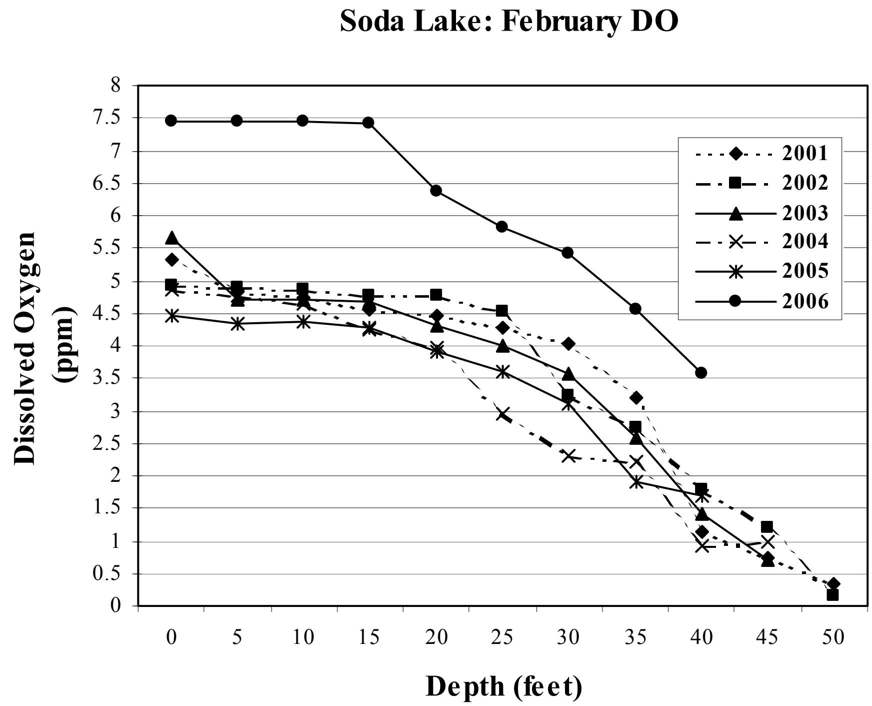

Figure 7. Dissolved oxygen concentrations (parts per million) from Soda Lake in February 2001-2006.

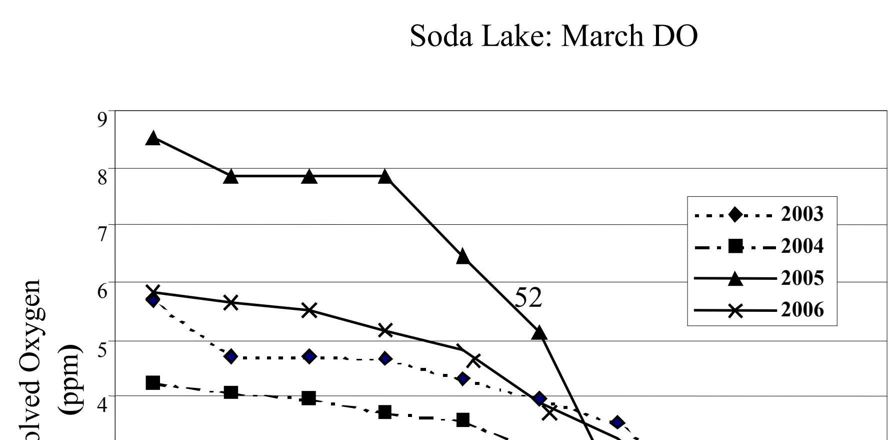

Figure 8. Dissolved oxygen concentrations (parts per million) from Soda Lake in March 2003-2006.

Figure 8. Dissolved oxygen concentrations (parts per million) from Soda Lake in March 2003-2006.

- Determine TRT survived. 512

TRT in Soda Lake experienced a winterkill again during the winter of 2005-06. The ice cap broke up sometime between April 27-29, 2006, and the lake was checked for dead fish on May 2, 2006. The water level of the lake was still below the bottom of the gage that was installed several years ago during a wetter period. Twenty-six dead TRT were observed, and most of them were found in the small, shallow bay located at the inlet. All of the dead fish that were shallow enough to allow identification were adult BNT from 17-25 in long, and all were badly decomposed. In addition, 1 dead neotenic SAL was found. Six live TRT (all >20 in long) and many live minnows were also seen at this time. One live FHM, likely suffering from a fungal infection, was also observed. Two FS nets were set for approximately 2.5 hours each on May 2, 2006 to verify that some BNT and BKT survived the winter. This sample produced 5 BKT (8.4-15.2 in) and 1 BNT (26.3 in).

Another fish die off was documented during July. An angler noticed several dead TRT in the bay at the inlet while fishing during the Independence Day Holiday. Unfortunately, he did not notify the Wyoming Game and Fish Department until several weeks later. The area was checked on August 3, 2006, and several large adult BNT were found dead at that time. These fish were all badly decomposed, so no samples were submitted for disease analysis.

Objective: Determine angler success and their satisfaction with fishing, and provide information to anglers about the conditions at Soda Lake.

- Conduct a creel survey. 520

A creel survey was conducted on May 10, 2006 (opening day), as has been done on opening day for several years. This data will be combined with data from other opening day surveys. The Aquatic Assessment Crew will analyze all of these data, and a summary report will be prepared from the results.

A press release was written to inform anglers about poor habitat conditions caused by prolonged drought, as has been done in previous years. The release also described what has been done in response to these conditions, and warned anglers to expect slow fishing in 2006. Local newspapers printed the story, and it seemed to help educate anglers about the current condition of the Soda Lake fishery.

Management Recommendations

- Continue to monitor the KOE spawning run at New Fork Lake annually and monitor the rest of the fish community every 3-4 years.

- Continue to monitor angler success with spot creel interviews. Reduce the creel limit at Soda Lake and continue to monitor the brood stocks and habitat conditions annually until the lake level rises substantially.

- Continue to inform the public about the problems causing the TRT populations to decline in Soda Lake. Stock all BNT in the spring, and all BKT in the fall at Soda Lake.