

Lee's Ferry, Long-term Rainbow Trout Monitoring

2006 Trip Report

(Trip LF20060404)

**David Ward, and Scott Rogers
Research Branch
Arizona Game and Fish Department
506 N. Grant Street, Suite L
Flagstaff, AZ 86004**



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The Lee's Ferry tailwater was sampled on April 4 – 6, 2006 as part of the cooperative agreement for Lee's Ferry long-term monitoring between the Arizona Game and Fish Department (AGFD) and the Grand Canyon Monitoring and Research Center (GCMRC). We sampled 27 stratified random and 9 fixed electrofishing (EF) transects in an augmented, serially alternating sampling design (Urquhart et al. 1998). Sampling of stratified random sites gives more accurate estimates of fishery status, whereas sampling fixed sites provides continuity to existing trend data. New sites were randomly selected without replacement from all available habitat types and stratified by river mile into upper, middle, and lower reaches. Each site was sampled by single pass electrofishing with an Achilles inflatable raft equipped with Coffelt CPS output regulators. We applied approximately 300-400 volts and 13-17 amps to a 35 cm stainless steel anode, while 2 crewmembers (per boat) netted stunned fish from the bow of each boat. The sampling crew consisted of Scott Rogers, Brian Clark, Clay Nelson, Teresa Hunt, and David Ward from the Arizona Game and Fish Research Branch. Stewart Reeder and Peter Weiss, contractors from Humphrey Summit, Inc., operated the two EF boats.

Water releases from Glen Canyon Dam ranged from about 7,000 cfs during the day and increased to about 12,000 cfs in the late evening. The average water temperature ranged between 8.1 °C and 9.1 °C. We measured captured fish to the nearest millimeter total length (TL) and weighed them to the nearest gram (fish <100 mm were not weighed). We examined all rainbow trout for the absence of left pelvic fins (LP2, GCMRC Floy tags and adipose fins (ADP, AGFD trout monitoring). Trout missing an adipose fin were scanned for the presence of a PIT tag and released. At fixed sites, we implanted PIT tags into trout over 150 mm total length (TL) and clipped their adipose

fins for future assessment of PIT tag loss. All previously unmarked native fishes received 134.2 kHz PIT tags. A total of 48 RBT were sacrificed at fixed sites for AGFD diet and age analysis.

We caught a total of 293 RBT, 2 brown trout (*Salmo trutta*; BNT), and 2 flannelmouth sucker (*Catostomus latipinnis*; FMS) (Table 1). Preliminary data indicate mean catch-per-effort (CPE; fish/min EF) of all RBT was 0.99 fish/min (Standard error = 0.29) at fixed sites and 1.09 fish/min (Standard error = 0.30) at random sites. Relative condition (kn) for fixed sites was 84.76 for fixed sites (Standard error = 2.26), and 84.5 for random sites (Standard Error = 1.3). We implanted 22 RBT with 400 KHz PIT tags. Rate of recapture for wild-spawned (PIT carrying) RBT was 2.73 % (N=8 recaps).

Rainbow trout catch per unit effort (CPUE) in the Lee's Ferry tailwater continues to decline. Historically the April Lee's Ferry monitoring trip has the highest catch rates of the year; however, this year catch rate continues to be very low. Overall CPUE from April 2006 sampling is lower than has been reported since monitoring began in the early 1990's (Figure 1). The combination of warmer mainstem water temperatures, low dissolved oxygen levels in 2005, and reduced food base are likely responsible for reduced trout numbers. As catch rates have declined, the condition (kn) of the remaining fish appears to be increasing (Figure 2). Although catch rates are low, the size distribution of the catch is bimodal and indicates there are small fish in the population (Figure 3).

Table 1. Number of each species captured during April 2006 Lee's Ferry sampling

Species	Number captured
Rainbow trout	293
Brown Trout	2
Carp	0
Flannelmouth sucker	2

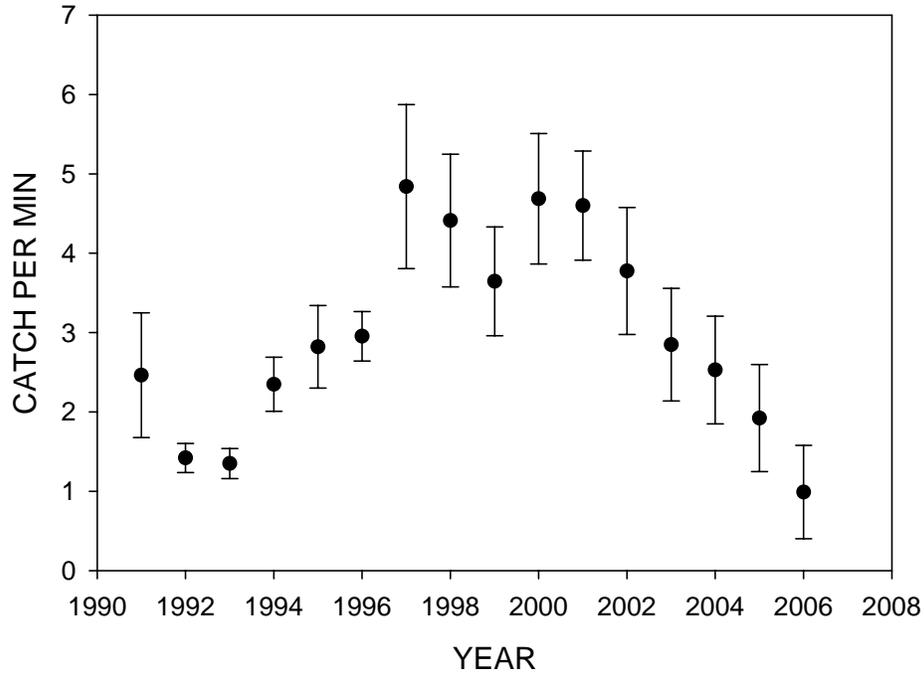


Figure 1. Mean catch per minute (electroshocking) for rainbow trout (RBT) by year at fixed sites (Lee's ferry 1991-2006, error bars = 2*SE).

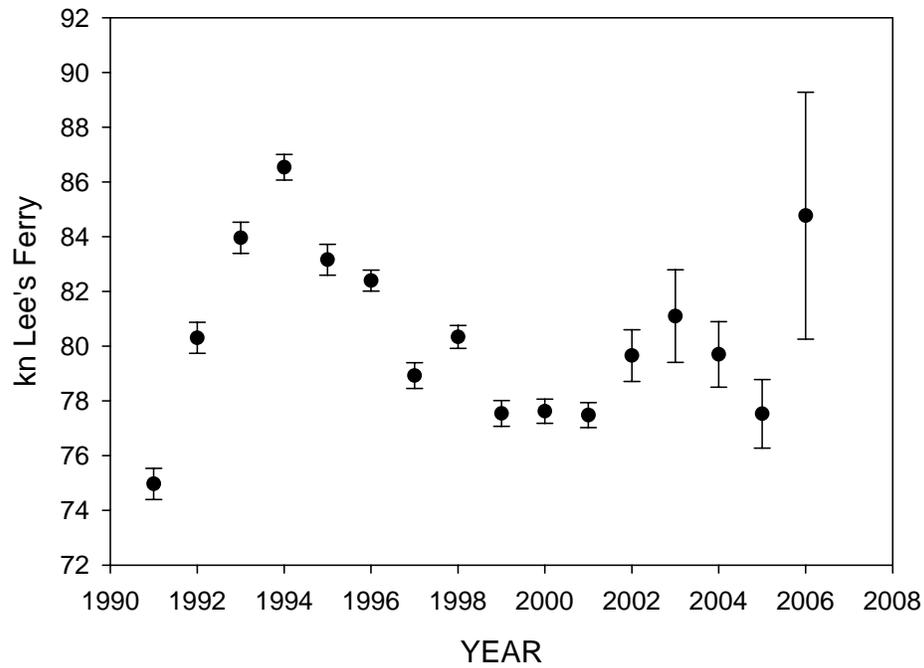


Figure 2. Mean condition factor (kn) for rainbow trout (RBT) by year at fixed sites (Lee's ferry 1991-2006, error bars = 2*SE).

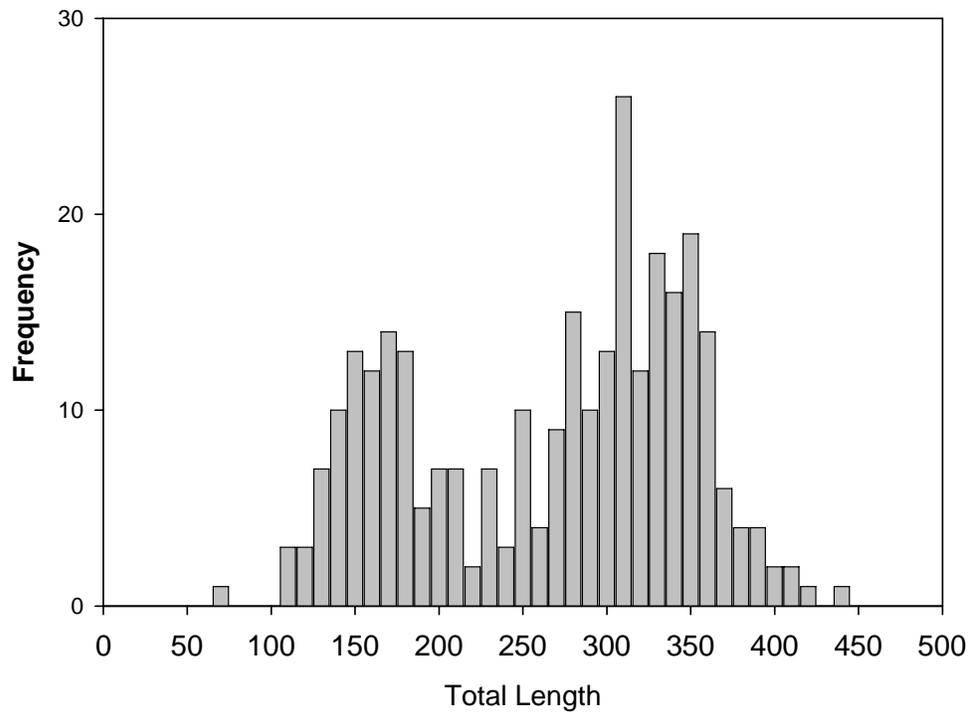


Figure 3. Length-frequency histogram of all rainbow trout captured during April 2006 Lee's Ferry sampling.

Reference

Urquhart, N.S., S.G. Paulsen, and D.P. Larsen. 1998. Monitoring for policy-relevant regional trends over time. *Ecological Applications* 8(2) 246-257.