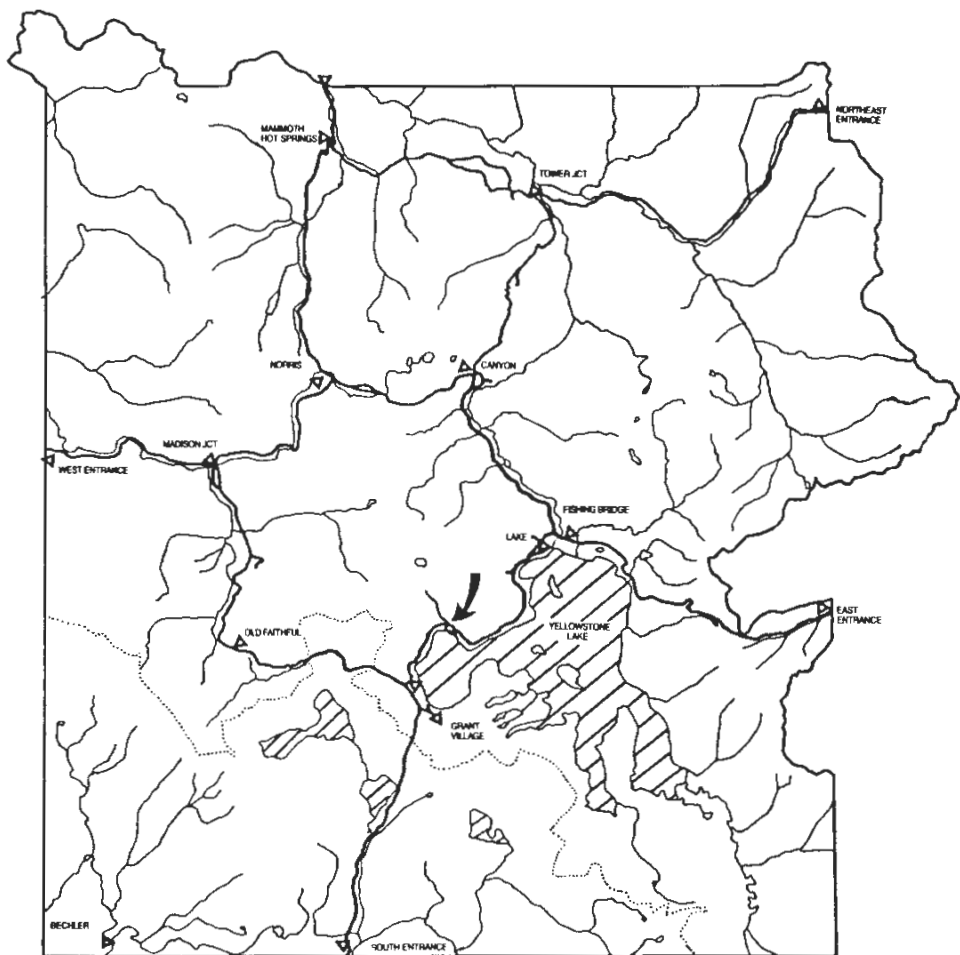


Yellowstone Takes Action To Avert Ecological Crisis

By Sue Consolo



Yellowstone NP added an exciting chapter to its long and varied history in fisheries management when non-native brook trout were discovered (in Spring 1985) to have been planted in a major tributary of Yellowstone Lake, a stronghold of the cutthroat trout. To save the native fishery – a major recreational resource for visitors and food resource for endangered species such as the grizzly bear and the bald eagle – the park took quick, drastic measures. An entire creek drainage was poisoned to prevent the non-native fish from taking hold, and an aggressive public information effort resulted in favorable press coverage and surprisingly little controversy. Preliminary results indicate the eradication effort was successful, and it is hoped that an ecological crisis in the ecosystem has been averted.

Poisoning park waters may seem overly severe for a park which has had exotic fish species for nearly a century. Surveys and stocking of park waters first occurred in 1889, when the U.S. Army (administering Yellowstone) and U.S. Fish Commission introduced brook, rainbow, brown, and lake trout to barren lakes and streams. For the next 70 years, fisheries management consisted mostly of stocking and hatchery operations. In 1936, an enlightened policy established that non-native fish introductions would not be expanded or allowed in waters containing native fish;

but all stocking did not cease until 1959. By that time, Yellowstone had 18 fish species, 6 of which were non-native. The exotic brown, rainbow, and brook trout are well-established and popular sport fish, especially in the western half of the park, in the Gibbon, Firehole, and Madison rivers.

The native trout are several subspecies of the cutthroat (*Salmo clarki*), which has received high levels of angling pressure and attention. Yellowstone Lake and River survived those decades of intensive management without establishment of other trout species. Today, these waters in the eastern half of the park contain the last major population of the Yellowstone cutthroat, which attracts thousands of anglers and observers to the late spring spawning runs. The lake and its trout also are a focal point for fish predators – eagles, ospreys, white pelicans, and grizzly bears.

A 3-5 person staff of U.S. Fish & Wildlife Service biologists is stationed in Yellowstone – full-time professionals and a seasonal crew who report to the Superintendent and are responsible for fisheries monitoring and management in the park. F&WS and NPS jointly fund this activity. In May of 1985 the F&WS staff were shocked to discover eastern brook trout (*Salvelinus fontinalis*) of several age classes in

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Arnica Creek, which flows into the West Thumb of Yellowstone Lake. The creek is one of the lake's 140 tributaries; where the waters meet, a long spit of land forms a 58-acre shallow lagoon. Some time since sampling last occurred here 4 years ago, the brookies appeared. Biologists discounted the possibility that the trout could have migrated across the park from the Madison drainage. The park staff suspects a deliberate effort by a sportsman looking to introduce his favorite fish, an act which Supt. Bob Barbee called "an act of vandalism."

Brook trout, while much smaller than cutthroat, present a severe threat to the native species, successfully outcompeting cutthroats nearly everywhere they have been introduced. Brookies spawn in the fall; the next spring the newly-hatched fry have a size advantage over young cutthroat, which hatch in the summer. Brook trout can not replace spawning cutthroat, in size or timing, as a key spring-summer food source for grizzlies. Nor can they entirely replace the food resource for other piscivorous predators, nor the recreation resource for 300,000 visitors annually.

NPS and F&WS personnel acted immediately. They built a sandbag barrier across the lagoon to prevent trout movement out into Yellowstone Lake and other streams flowing into it. Adjacent tributaries were sampled, but no brook trout were found there or in the Arnica Creek lagoon. The resource management staff prepared an EA with 3 alternatives: 1) do nothing; 2) strengthen the lagoon barrier and electrofish, taking an estimated 5-10 years to achieve a 50 percent probability of success; and 3) eliminate all fish in Arnica Creek with a piscicide, Fintrol. The latter was selected as most cost-effective (\$35,000) and timely. Treatment was set for late August in order to get the brook trout prior to spawning but during low water; this lessened the chance that fish would move between the creek and Yellowstone Lake. Dry summer weather simplified the task; only 10 miles of creek had water, instead of the 48 miles watered in wetter summers.

Prior to treatment, the park issued a park release offering \$1000 reward for information leading to the

conviction of the culprit who planted the brook trout. Such introductions have been illegal in Yellowstone for over 40 years. The park's public information office invited the press to come and watch the fish kill occur, and alerted fisheries biologists to stand by and answer questions if necessary. Park interpreters were stationed along the road near Arnica Creek to explain the situation to park visitors. As reporters and photographers gathered, resource managers nervously hoped the operation would go as planned!

Beginning at 6 a.m. on Aug. 27, 30 workers applied the toxicant Fintrol at 11 drip stations in Arnica Creek and springs up and down the drainage. Rangers and biologists boated back and forth across the lagoon, applying the poison. Personnel stood by with a neutralizer, in case the treatment escaped into the lake. Fintrol, a selective antibiotic that kills fish by inhibiting respiration, has a half-life of about 6 hours, and, at the applied concentrations of 4-8 parts per billion, will not kill other aquatic animals. Drip stations ran for 24 hours, but within the first 6 hours of application, the

fish – mostly under 4" in size – began to succumb. No more than 100 lbs. of protein was estimated to have been removed from the drainage.

Monitoring activity continues. One week after the treatment, stream and lagoon sampling turned up no live fish. On Sept. 30, F&WS and NPS staff strengthened the sandbag barrier and placed a fish trap in the exit to the lagoon to collect any brookies trying to enter the creek to spawn. To assure total kill, a repeat application of Fintrol may be necessary.

The operation attracted national and local press, and surprisingly little controversy for a park accustomed to scrutiny of its planning and resource management actions. News articles and editorials were almost unanimously supportive. As both a biological and a public relations effort, it appears that the Arnica Creek fish eradication project was a success and that it occurred in time to prevent collapse in the food web in and around Yellowstone Lake.

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U.S. Fish and Wildlife Service biologists set a fish trap in the Yellowstone Lake outlet of Arnica Creek.



Asst. Chief Ranger Gary Brown inspects alien brook trout removed from Arnica Creek.