

Yellowstone's Native Fisheries: Opportunities for Native Fish Conservation & Restoration



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Executive Summary

The Greater Yellowstone Ecosystem is one of the largest intact temperate ecosystems in the world, but its native fish face an uncertain future. The Arctic grayling, westslope cutthroat trout and Yellowstone cutthroat trout, once abundant in the ecosystem's lakes, rivers and streams, are facing significant declines in their populations. Threats include hybridization and competition with non-native species, loss of habitat, disease and climate change. The loss of native fish from the ecosystem would have impacts on the nutrient cycle that has been functioning for millennia, and would be devastating to the chances of these species survival.

Federal and state agencies have adopted management plans aimed at preserving and restoring fish populations. The goals of the National Park Service's Native Fish Conservation Plan: to help rebound and stabilize Yellowstone cutthroat populations in Yellowstone Lake, establish multiple genetically pure populations of westslope and Yellowstone cutthroat trout, and restore a fluvial population of Arctic grayling.

Outside of the park, the U.S. Forest Service has teamed up with the State of Montana to protect genetically pure populations of cutthroat and restore populations that have experienced hybridization. Using fish barriers and piscicide treatments, the two agencies share the work of conservation for the westslope cutthroat trout and Yellowstone cutthroat trout in much of the Greater Yellowstone Ecosystem.

The federal and state agencies involved in native fish conservation in Greater Yellowstone are not working alone. Through the establishment of Memorandums of Understanding, non-profit groups and government agencies are working in coalition to help conserve and restore native fish populations and habitat. National Parks Conservation Association (NPCA) is a signatory of one of these agreements with the National Park Service.

A History of Native Fisheries

When the first European Americans reached Yellowstone, the area was home to a wide variety of fish species. French and American trappers and explorers, as well as scientists and the early visitors to the park noted the abundance of fish in the area's lakes, rivers and streams. However, not all waters in the ecosystem historically supported fish populations. Surveys done after the establishment of Yellowstone National Park estimate that 48% of the waters were fishless.

Almost as soon as Yellowstone National Park was established, park managers began stocking lakes, rivers and streams with both native and non-native fish species. During the early years the park was managed by the U.S. Army and stocking, data gathering, and monitoring of fish was conducted. Stocking of waters began in 1881, and the first known non-native fish were stocked in 1889 and 1890.

In 1916, the National Park Service was established and the U.S. Army was relieved of its duty to manage the park. Management of fisheries shifted to the sole purpose of recreation. Most of the waters that were historically fishless had been stocked with either native or non-native species or both. In addition to stocking native and non-native fish, a fish hatchery had been established on Yellowstone Lake.

In the mid 1950's, a major shift in the management of park fisheries occurred. The emphasis in stocking non-native fish ceased in favor of wild fish management, native species conservation and recreation.

When the shift in management of native fisheries occurred in the mid 1950's, native fish populations were in decline. Due to liberal fishing regulations and the stripping of eggs at the Yellowstone Lake fish hatchery, the population of Yellowstone cutthroat in Yellowstone Lake was on the verge of collapse. In 1954, at a weir used for counting spawning trout on a tributary to Yellowstone Lake called Clear Creek, over 3,100 fish were counted. However, following the closing of the hatchery and tightening of fishing regulations, native trout populations exploded. In 1979, more than 70,000 Yellowstone cutthroat were counted at the Clear Creek weir. Population estimates in Yellowstone Lake were around 3.5 million fish.

While the Yellowstone cutthroat seemed to be faring well, grayling were disappearing. Arctic grayling were once found in the Gallatin and Madison Rivers, Fan Creek, Grayling Creek, and the Firehole River. However, the introduction of non-native brown trout and the construction of the Hebgen Reservoir dam caused the disappearance of fluvial populations from the Madison and Firehole Rivers. There were efforts to restore fluvial grayling populations in the park from 1975 to 1995. These efforts were not successful. Today, the only grayling populations within the park are found in Grebe Lake, Wolf Lake and in the Gibbon River.

Another significant shift in management of fisheries occurred in 1994, when a single lake trout, an aggressive and affective predator of native cutthroat trout, was caught by an angler in Yellowstone Lake. With the discovery of lake trout in Yellowstone Lake in 1994, a scientific advisory panel convened to discuss the consequences and possible actions for impeding the lake trout population. In 1995 and 1996, the National Park Service began a gillnetting program

to determine the age and size structure of the population. From 1997 to 1999, gillnetting efforts increased, but the numbers and size of the fish caught indicated the lake trout population was expanding. In 2001 the park purchased a gillnetting boat and hired support staff. From 2001 to 2007 gillnetting removed over 270,000 lake trout, yet lake trout populations continued to expand.

In 2008 a second scientific advisory panel convened. The 2008 panel provided several recommendations including expanding gillnetting, increased monitoring of lake trout and Yellowstone cutthroat populations, and developing a formal suppression plan. The National Park Service responded by increasing gillnetting in 2008, and despite signs that gillnetting is slowing the expansion of the lake trout population, Yellowstone cutthroat population numbers have continued to sink to the lowest in recorded history.

In July of 2011, National Parks Conservation Association joined a coalition of non-profit organizations in a Memorandum of Understanding with Yellowstone National Park to support each other's efforts in the conservation and restoration of native fish in Yellowstone National Park.

Justification

In July 2011, an MOU was signed by six non-profit organizations and Yellowstone National Park. The purpose of the MOU: to enhance and maintain a cooperative relationship between the National Park Service and conversation partners to ensure the protection of Yellowstone's native fisheries.

Partners in the MOU are: Trout Unlimited, Wyoming Council of Trout Unlimited, Montana Council of Trout Unlimited, Idaho Council of Trout Unlimited, National Parks Conservation Association—Yellowstone Field Office and Greater Yellowstone Coalition.

Among the goals of the MOU is to conserve and protect ecosystems that ensure the survival of native coldwater fisheries. Cooperative activities mentioned in the MOU include inventory and monitoring, research, public education and outreach, habitat management, fisheries management, and pooling and leveraging resources.

As populations of some native fish continue to decline throughout their historical ranges, the unique characteristics of the GYE offer excellent opportunities for restoration and protection efforts:

- The management philosophy of national parks and congressionally designated wilderness has and will protect streams and rivers from degradation caused by human development.
- The GYE and Yellowstone National Park contain the headwaters of rivers, and the main stems of river systems and large lakes. Thus, there is the potential for maintaining habitat of all life stages of fluvial and adfluvial fish.
- The Upper and Lower Yellowstone Falls act as a fish barrier on the Yellowstone River preventing migration of rainbow trout above the falls creating a large watershed with a genetically pure Yellowstone cutthroat. This population, if restored, could mean the difference between a stable population and the species having to be listed for protection under the Endangered Species Act
- The high altitude of the GYE may offer some refuge for cold water fish species from climate change
- Despite having many different agencies involved in the management of fisheries, large areas within the ecosystem are managed by a single entity. For example, Yellowstone National Park is 2.2 million acres and all of its resources are managed by the National Park Service. A single entity in charge of managing all of its natural resources over such a large area is extremely rare in the lower 48 states
- There are genetically pure populations of westslope cutthroat and Yellowstone cutthroat in the ecosystem
- There are opportunities for reintroducing fluvial populations of grayling

The Importance of Native Fish to Yellowstone National Park

The loss of native fisheries in Yellowstone National Park could have irreparable impacts to the following characteristics of Yellowstone National Park:

- Significant alteration of natural processes that occur in and outside of the park
- Loss of a food source for the grizzly bear, one of the most iconic species of Yellowstone National Park
- Loss of a food source for other species such as the otter and bald eagle
- Devaluing an important recreational opportunity for park visitors

A Landscape Conservation Approach

Native fish populations play a role in the natural processes of the ecosystem. If native fish species were to disappear from the ecosystem, natural processes would be altered, eroding the potential for survival of other iconic species of Yellowstone such as grizzly bear and the bald eagle.

The threats to native fish, such as disease, non-native species, and climate change transcend political boundaries. Actions outside of the park will have to be taken to ensure native fisheries survival not only within the ecosystem, but within Yellowstone National Park itself.

Opportunities

In May of 2011, the National Park Service finalized its Native Fish Conservation Plan for the preservation and restoration of native fish in Yellowstone National Park. Yellowstone National Park's plan to restore native fisheries is divided into two areas. One management area is Yellowstone Lake where the primary focus is on managing lake trout populations in an attempt to restore Yellowstone cutthroat populations. The other area is lakes, rivers and streams outside of the Yellowstone Lake watershed. In areas outside of the Yellowstone Lake watershed, efforts focus on restoring genetically pure populations of fluvial grayling, westslope cutthroat and Yellowstone cutthroat.

Yellowstone Lake

The most critical issue in the Yellowstone Lake watershed is the impact of illegally introduced lake trout on native Yellowstone cutthroat and how lake trout are affecting the entire ecosystem. The strategy is to reduce the population of lake trout, which should allow Yellowstone cutthroat numbers to rebound. Below is a summary of recommended actions:

- Gillnetting of lake trout
- Reconnecting spawning tributaries to Yellowstone Lake
- Reintroduce Yellowstone cutthroat trout embryos to former spawning streams
- Improving suppression efforts through reviews and research
- Monitoring of fish populations

Other lakes, streams, and rivers

Native fish restoration and protection will occur in lakes, streams and rivers outside of the Yellowstone Lake watershed. The following is a summary of actions considered in the park's native fish conservation plan:

- Construction of fish barriers
- Chemical removal of fish
- Stocking of native fish
- Developing and maintaining a native brood stock in the wild
- Mechanical removal of fish
- Genetic swamping
- Angling
- Selective passage of fish
- Destruction of non-native fish embryos
- Improving connectivity of native fish habitat

A Native Fisheries Conservation Program

The ultimate goal in NPCA's native fish conservation program is to restore native fisheries, restore the functions of Yellowstone Lake and preserve a cherished recreational opportunity for visitors to Yellowstone National Park.

The goal of the native fish conservation program:

Protect and ensure the presence of native fish populations in Yellowstone National Park for present and future generations

NPCA can implement the following actions to help move native fish conservation protection and restoration forward:

Organize/participate in volunteer projects in Yellowstone National Park

- Continue to support lake trout research
- Reconnect spawning tributaries to Yellowstone Lake
- Organize and conduct angler field trips
- Conduct re-vegetation projects
- Monitor fish barriers

Organize/participate in volunteer projects outside Yellowstone National Park

- Organize, conduct and/or participate in volunteer projects with the Gallatin National Forest and Montana Fish, Wildlife & Parks
- Organize, conduct and/or participate in riparian restoration projects with private landowners

Continue to advocate for adequate federal funding for native fisheries projects

- Seek small and large private donations for projects

Highlight the importance of native fisheries conservation

- Educate NPCA membership
- Conduct targeted outreach to Yellowstone National Park visitors
- Raise awareness of native fisheries conservation in Yellowstone's gateway communities

Engage decision makers

- Educate local, regional and national decision makers on native fisheries conservation

Maintain, build and deepen communication and relationships with management agencies and our conservation partners

- Through frequent communication, identify common goals and pursue new opportunities for native fisheries conservation efforts
- If strategically practical, assist and encourage additional non-profit organizations to participate in native fish conservation efforts

Conclusion

Native fish in the Greater Yellowstone Ecosystem face a difficult future. Without successful conservation and restoration efforts from federal and state agencies and conservation groups, native fish may face extinction. The loss of native fish species will affect the natural and human landscapes within Yellowstone National Park and throughout the Greater Yellowstone Ecosystem. Currently there is an excellent opportunity for NPCA to deepen its involvement in helping to protect and restore native fish populations inside and outside Yellowstone National Park. This report can be used as a starting point in developing a strategy for National Parks Conservation Association to move forward with its native fisheries conservation efforts.

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A copy of the full report is available from the Yellowstone Field Office. Contact: Patricia Dowd, Yellowstone Program Manager, pdowd@npca.org or 406.585.1380.