The Wild West of Reservoir Fisheries Management: A Case Study of Flaming Gorge Reservoir, Wyoming-Utah.

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by:

Stephen L. Klobucar, Ph.D. student

Department of Watershed Sciences and The Ecology Center, Utah State University, 5210 Old Main Hill, Logan, Utah, 84322-5210, USA

Phone: (608)-289-5687

Fax: (435)-797-4025

Email: stephen.klobucar@gmail.com

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Burbot. Scientific name—*Lota lota*. Known by any other name, it would still mean a *Lota lota* concern for fisheries managers in the western United States.

Truth be told, beyond their common moniker, Burbot are already known by various other names such as "ling," "eelpout," and "lawyer," depending on the preferred regional vernacular. From the French word "la Lotte," meaning codfish, Burbot are the only freshwater member of the cod family. While Burbot are found in northern latitudes around the world, many of their populations in native habitats (cool- to cold-water rivers, streams, and lakes) are in decline due to factors including increased river regulation and declining water quality. In Wyoming, where Burbot are native east of the Continental Divide, populations have been adversely affected by human water use for irrigation and hydropower. However, in Wyoming west of the Divide, Burbot are nonnative and a newly expanded population is thriving. This expansion, promoted by 'bucket biologists,' threatens an extremely popular sport fishery, Flaming Gorge Reservoir (FGR).

On the border of Wyoming and Utah, FGR is home to numerous sport fishes and distinguished by high catch rates and trophy potential. In fact, state angling records for Lake Trout (WY and UT), Kokanee Salmon (WY and UT), Rainbow Trout (UT), Brown Trout (WY and UT), and Smallmouth Bass (WY) have been caught in the waters of FGR. While these fishes are also nonnative, they were intentionally stocked by state management agencies to provide angling opportunities, which flourished into a world-class reservoir fishery. However, this socio-economic asset was met with uncertainty following the introduction of Burbot, which created concern for anglers and managers alike. We sought to quantify the potential impacts of Burbot on prized sport fishes of FGR, and to better understand their expansion success, which for the first time, is outside of their native range.

In their native range, Burbot are known to be voracious predators often consuming a diet of other fishes. In FGR, this could mean that they are eating many of the sport fish that anglers desire and/or many of the prey resources that valued sport fishes require to become large and numerous. We studied the stomach contents of hundreds of Burbot and found that Burbot eat crayfish 50 -

90% of the time, and at times, up to almost 50% of their diet is other fishes. Rainbow Trout and Smallmouth Bass also eat crayfish, and thus, are most likely to be negatively affected by Burbot, especially if crayfish populations decline. Further, when Burbot eat sport fishes, we found that Rainbow Trout are their preferred meal. Using a model to predict the reservoir-wide impact of Burbot, we estimated that these predators could eat double the amount of Rainbow Trout that are stocked annually into FGR. In other words, the population of Burbot in FGR could eat more than the weight of 18 adult elephants in Rainbow Trout alone! On the other hand, when we examined the stomach contents of large Lake Trout, the most likely potential predator of Burbot in FGR, we did not find any evidence of Burbot in their diets. Thus, while Burbot are not often revered as a sport fish, owing to slimy, eel-like appearance, angler harvest may be one of the most effective means of reducing the population in FGR. Despite their appearance, Burbot are excellent table fare, known by another name as "poor man's lobster."

Reservoirs, by their very nature, are highly managed waterbodies. The management of reservoir fisheries represents a delicate balance of predators and prey, aligned with angling opportunity, and ultimately, angler satisfaction. The easiest way to maintain this balance and to foster angler success is to trust the fisheries professionals charged within managing these resources. No matter how well intentioned unauthorized introductions of fishes may be, the negative consequences always outweigh potential benefits, and the effects of Burbot in FGR is just one of the many (many, many) case studies nationwide that highlights the necessity of minimizing these unauthorized introductions.