


Flannelmouth Sucker: The Ironhorse of the Colorado River Basin

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When I began graduate school in 2012 at Kansas State University, I was excited to work with the highly endemic fishes of the Colorado River basin, particularly federally endangered Colorado Pikeminnow *Ptychocheilus lucius*. However, low catch rates combined with limited historical catch data for Colorado Pikeminnow shifted my research focus toward community-wide investigations of native and nonnative fishes in the tributaries of the San Juan River, located within the upper Colorado River basin. The occurrence of endangered fish species in some of the smaller tributaries of the upper Colorado River basin had been documented; however, the role of tributaries in the persistence of native fishes in the San Juan River basin was relatively unknown. Upon this shift of perspective, another endemic fish captured my attention, stealing the spotlight from the big river minnow.

McElmo Creek, a small tributary of the San Juan River, flows from juniper and red rock beginnings in the hills near Sleeping Ute Mountain in Colorado, a mountain resembling the prone earthbound body of a warrior that, as legend has it, will one day rise to reclaim the Ute's ancestral lands. After flowing through the lush, green canyons in Colorado—where mule deer *Odocoileus hemionus* roam among the irrigated alfalfa fields, and predators such as mountain lions *Puma concolor* and black bears *Ursus americanus* leave tracks in the soft mud along the creek that betray their aloofness—McElmo Creek meets the Navajo Nation at Utah's border where the landscape abruptly transitions to a dusty, hot landscape treaded by packs of once-domesticated dogs *Canis familiaris*, feral horses *Equus ferus caballus* with their hides stretched tightly against their skeletons, and anxious collared lizards *Crotaphytus collaris*. Amidst oil wells and small, sparse collections of houses and trailer homes, the creek winds 32 km over boulders, cobble, and gravel until it meets the San Juan River with a small sandy delta near the modest, one-gas-station town of Aneth, Utah. The invasive thorny Russian olive *Elaeagnus angustifolia* lines much of the creek, but other common riparian vegetation includes nonnative saltcedar *Tamarisk* spp. and, in upstream reaches, native eastern cottonwood *Populus deltoides*. For reasons beyond my understanding, the creek is a dumping ground for dead dogs (usually shot and left to rot, sometimes drowned), discarded pornography, and a spread of empty or smashed beer and liquor bottles, which makes the stream and highway ditches glitter in the hot sun. I still have a picture of 14 malt liquor bottles bobbing in an eddy at our primary site at the mouth of McElmo Creek. More gruesomely yet is the fact that in the time I worked there, two homicides occurred at the confluence. Although it is a sinful wasteland to some humans with high aesthetic standards, McElmo Creek is an oasis to other animals, especially Flannelmouth Sucker *Catostomus latipinnis*.

When waters warm in late winter to early spring, a veritable exodus of Flannelmouth Sucker herds begins among and

within mainstem and tributary streams of the Colorado River Basin. In McElmo Creek, these February and March migrations of thousands of individuals occur when temperatures exceed 5°C and can cover in excess of 35 km (Cathcart et al. 2015, 2018). The migration is even more impressive because mature Flannelmouth Suckers range from 300 to 600 mm total length and can live upwards of 30 years old. Often spurred by early spring storms, the upstream migration is a variable movement that covers a few weeks to coincide with lower water levels in the tributary. Upon reaching a segment of stream where spawning occurs, the fish have a relatively relaxed day-to-day schedule.

Similar to what Weiss et al. (1998) found in the Grand Canyon's Bright Angel Creek, Flannelmouth Suckers wait until the afternoon to begin spawning in the clear waters of McElmo Creek. During our days observing spawning suckers in oilfield reaches of the creek, we noticed the first fish poking its nose out of a deep pool at about 12:30 pm. Soon, another fish followed, then two more. The moving fish added up until dozens of suckers were aggregated in run or riffle habitats upstream of their refuge pools. Most often a female was joined by two to three males, but sometimes a single female would be piled on by upwards of 10 males. If multiple females were in close proximity to each other, a spawning aggregation could accumulate over 30 individuals. When spawning occurred, males and females synchronized 5 to 60 s shivers that ejaculated sperm and eggs into gravel and cobble substrates. Most fish spawned in less than 50 cm of water and in shallow waters where their backs were exposed to air, spawning fish created roostertails of water that arched over 25 cm into the air. Afternoon delight indeed.

After spawning, most Flannelmouth Suckers immediately swam back to the San Juan River to resume their mainstem lives. However, not all individuals survive to see the next spring. Due to shallow water pathways and sheer size of the migration, many individuals fall prey to terrestrial predators. Game cameras and sampling data (i.e., wound and scar data) from McElmo Creek documented common interactions between Flannelmouth Suckers and great blue herons *Ardea herodias* as well as other animals such as bobcats *Lynx rufus*. Carcasses in varying states of decomposition were also scavenged by other animals such as turkey vultures *Cathartes aura*, ravens *Corvus corax*, and raccoons *Procyon lotor*. This may be a far cry from the ecological offerings provided by nutrient-rich semelparous salmonids of the Pacific, but it should not be overlooked either.

In fact, these fish provide value to people as well, in ways that go beyond pure appreciation for their existence. Friends and even fly-fishing shops on the West Slope of Colorado routinely post pictures of Flannelmouth Suckers landed while nymphing for trout. Many of the Navajo we talked to catch Flannelmouth Sucker, but since suckers are “too bony,” they



A male Flannelmouth Sucker dies just downstream of a spawning aggregation after being stabbed in the back by a great blue heron.



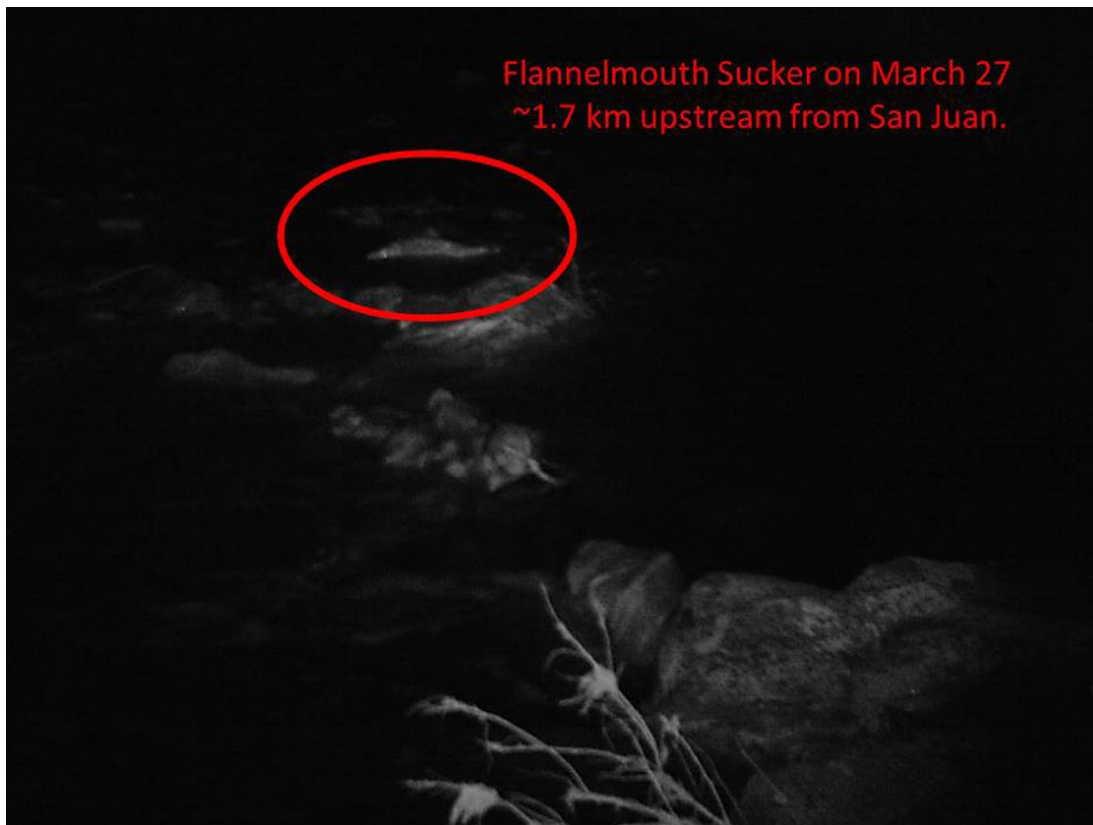
The remnants of a female Flannelmouth Sucker on the bank of McElmo Creek.



Male (top) and female (bottom) Flannelmouth Sucker sampled in the oilfield area of McElmo Creek approximately 25 km upstream from the San Juan River. Note the sexually dimorphic spawning coloration as well as the anal fin shape.



Typical habitat where Flannelmouth Sucker spawning occurs in McElmo Creek, Utah. This is on the oilfield reach (note the oil pipeline in the background).



Game camera footage of Flannelmouth Sucker migrating over a riffle on its way back to the San Juan River.

prefer to catch nonnative Channel Catfish *Ictalurus punctatus*. Even an old, nearly deaf Colorado farmer who lives along McElmo Creek (and was hitchhiking to town) transitioned his initial skepticism toward sucker research to a nostalgic high-volume anecdote about him and his now-dead brother catching hundreds of spawning suckers with a net laid across the streambed that they lifted into the air after Flannelmouth Sucker schools swam over their trap. He claimed the suckers made the greatest Coyote *Canis latrans* bait in all the land.

Flannelmouth Sucker share much in common with other co-occurring imperiled fishes of the American Southwest in terms of habitat alteration, range loss, hybridization, interactions with nonnative fishes, and underappreciation by humans. What separates them from others has been their ability to maintain almost half their range throughout the Colorado River basin. But this has not been without challenges. The population of Flannelmouth Suckers downstream of Hoover Dam were extirpated and then repatriated, with success, in 1976 (Mueller and Wydoski 2004). Additionally, many populations, especially in the upper Colorado River basin, now suffer from hybridization with nonnative White Sucker *C. commersonii* (Mandeville et al. 2015). As it is, the San Juan River population (along with the tributary spawning subpopulations), may offer one of the most viable populations along with Grand Canyon and the lower Colorado River. Current research exploring Flannelmouth Sucker life history characteristics from larval growth to adult movements are helping to explain how these fish perform in a changing world while also identifying factors that could threaten their populations (see Fraser et al. 2017).

According to the horse-themed traditions within Catostomidae (see Becker 1983 for colloquialisms whereby Blue Sucker *Cycleptus elongatus* is nicknamed the Blackhorse

and *Moxostoma* spp. are called the Redhorses), I declare the Flannelmouth Sucker to be nicknamed the Ironhorse. The Ironhorse, implying traits of endurance as well as invoking their appearance, fits because these fish reliably spawn year after year after year and have rusty flanks that blend into the sandy substrates and turbid waters of southwestern rivers. Common names will always have their place in science, but colloquialisms can sometimes imbue a better sense of pride for and impression from the wonderful creatures we study.

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