Ocklawaha River Restoration
Fish Habitat

KEY REFERENCE: *"Fish biomass estimates conducted by visuals surveys in the 1950s, 1979-80, and 2004-05 found that abundance of at least three dominant fish species (striped mullet, channel catfish, and gizzard shad) were reduced by about 92% over the fifty-year period of record in Silver Springs."* (Doug Munch et al. 2007).

Current Conditions

- Declining diversity and biomass across all fish species due to loss of natural riparian and seasonally inundated floodplain habitat.
- Upstream migrations of once-abundant native anadromous fish species (American Shad, River Herring, Hickory Shad, Atlantic Sturgeon, Shortnose Sturgeon, Striped Bass) and catadromous American Eel, now essentially blocked, with only rare passage through the Buckman Lock.
- Connectivity broken between upstream migratory fish freshwater spawning habitat (above impoundment) and downstream low salinity estuarine nursery and transitional feeding habitat.
- Ecosystem connectivity broken and energy-transfer between estuary and river lost for additional transient freshwater-tolerant coastal-estuarine fishes and mobile invertebrates (e.g., Striped Mullet, Atlantic Needlefish, Sheepshead, Hogchoker, Blue Crab, etc.)
- Essential riverine fish habitat attributes of uninterrupted flow, oxygenation, and natural river level fluctuations negatively altered by dam and artificial impoundment.
- Original character of dynamic free-flowing river altered to a sluggish, weed-filled lacustrine impoundment.

Partial Restoration Benefits

- Potential restoration of originally-abundant anadromous and catadromous fish populations via access to upriver spawning and trophic habitat.
- Nutrient enrichment of the upper river via energy transfer (spawned fish eggs, larvae, excreted nutrients, and migratory and transient fish biomass available to predators (predatory fishes, alligator, osprey, eagle, otter)
- Restoration of naturally connectivity and functionality between free-flowing riverine reaches and downstream estuarine larval and juvenile fish nursery habitat and mixing zone feeding habitat, and for now-fragmented adult populations (e.g., White Catfish, Channel Catfish).
- Restoration of fish diversity and abundance in the upper Ocklawaha River and Silver Spring.
- Expanded high-quality sportfishing opportunities for Striped Bass and American Shad in the overall river.

- Potential increase in stream habitat for State-listed Species of Concern (e.g., Bluenose Shiner and Southern Tessellated Darter) via re-establishment of tributary flows river from Orange and Deep creeks.
- Expanded ecotourism for boaters, paddlers, and snorkelers interested in viewing and photographing fishes, including large charismatic sturgeons in the clear waters of the restored river and re-emerged springs.

Improving Fisheries through Dam Removal

As America addresses the backlog of dam maintenance needs and the growing public interest in water resource conservation and fisheries improvements, there has been growing support to remove dams where the costs outweigh the public benefits or where the dam no longer serves a valuable purpose. Since 1912, an estimated 1,605 dams have been removed in America with 91 of the dams being removed in 2017 alone (source – American Rivers).

Many dams have outlived their original purpose – hydropower, irrigation, water supply or flood protection. The Rodman Dam is unique because it was never used for its intended economic purpose. After the Cross Florida Barge Canal project was halted, the impoundment behind the dam evolved into a Largemouth Bass sportfishing area. In the early years, bass fishing in the impoundment peaked, contributing significantly to the local economy. However, as is typical in the evolution of artificial impoundments, once carrying capacity is reached, maximum fish size decreases over time. Today, the fishery has declined. Now, trophy bass are more frequently caught by anglers using the St. Johns River proper. As is also typical for impoundments, there is progressive over-vegetation and siltation, requiring repeated expensive maintenance. The reservoir is choked with exotic vegetation and requires constant manipulation to avoid fish kills. Nutrients and contaminants tend to accumulate in the impoundment. A health warning has been issued for fish consumption by pregnant women and children.

The removal of dams in various states in recent decades have provided numerous examples of how migratory fish species have naturally and successfully repopulated natal rivers (Bangor Daily News, 2009), (Hit et al. 2012). Restoration of natural ecosystem functioning has been documented to promote strong year-classes in resident fish species (Hill et al. 2018). Re-establishment of native fishes in the river and connectivity with estuaries also boosts overall fish diversity, abundance, and biomass. Often this results in high quality sportfishing, boating, and ecotourism opportunities, attracting visitors, and boosting the economies of nearby communities. Additionally, restoring free water flow may reduce pooling and concentrations of environmental contaminants. (Davis et al. 2017,) Indeed, multiple ecosystem benefits accompany dam removal and associated habitat restoration. (U.S. EPA)

Restoring Migration Routes and Connectivity in the Ocklawaha Ecosystem

Removing the dam would restore ancient habitat and migration routes for fish and mammals. Restored access to the upper river would attract American Eel, American Shad, Hickory Shad, River Herring, and endangered Atlantic Sturgeon and Shortnose Sturgeon. Access for the Florida-strain of Striped Bass to their primary spawning area – the Ocklawaha and the Silver Rivers – would be restored. Now the only Striped Bass in the entire St. Johns are stocked non-reproducing, northern-strain hatchery fish. Over 20 million Striped Bass have been stocked since 1972 (FWCC), with no appreciable population restoration. Fragmented and depleted

Channel Catfish and White catfish populations would be reconnected, facilitating repopulation of Silver Spring.

Striped Bass require about 50 unobstructed stream miles for reproduction. The Rodman Dam is most likely responsible for the loss of naturally reproduction in the St. Johns River due to denial of access to upstream spawning grounds. The Florida Fish and Conservation Commission and the US Fish and Wildlife Service stocked 22,440 striped bass fingerlings into the Ocklawaha River system upstream of the Rodman Dam during May 2015. In order to keep the recover a naturally reproducing and expanding population, the Rodman Dam should be breached providing a swift, unfragmented, 56-mile long Ocklawaha River. (Nosca, 2017)

Projected Improvements for Fish and Wildlife

"Removing the Kirkpatrick Dam on the Ocklawaha River deserves the highest priority to provide open passage for aquatic wildlife between the Atlantic Ocean and St. Johns River and Silver Springs. The Eureka Lock and Dam on the Ocklawaha River downstream of the Silver River are not impassable, as the dam itself was never completed. However, the existing structures at Eureka are still an impediment to some fish and wildlife use and should also be removed. Breaching or removing these dams would predictably increase the diversity and dominance of fish and other aquatic wildlife species within the river ecosystem. In addition, dam breaching will increase the forage fish food base for many larger fish, wading and water-birds, reptiles and mammals that utilize the Silver Springs System." (Restoring Silver Springs: An Action Plan, 2014).

"Faunal studies conducted at Silver Springs indicate that macroinvertebrate (aquatic insects, snails and crayfish) communities, while abundant in numbers, are not diverse and are declining in productivity. Fish counts over the last 50 years indicate relatively high diversity but a substantial loss in fish numbers and biomass", (Florida Springs Conservation Plan, 2018).

Fish abundance and biomass has declined substantially in Silver Springs versus baseline 1954 numbers. In a census conducted in 2019, fish biomass had declined 39% from Odum's 1954 data. A comparable 2005 study conducted by University of Florida revealed the lowest biomass yet measured, although methods used may have differed versus 1954, (Rogers et al. 2005). Compared to the Odum data, the average reduction in total estimated fish biomass determined across all studies is ca. 67%. "Fish biomass estimates conducted by visuals surveys in the 1950s, 1979-80, and 2004-05 found that abundance of at least three dominant fish species (striped mullet, channel catfish, and gizzard shad) were reduced by about 92% over the fifty-year period of record in Silver Springs", (Munch et al. 2007).

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