HYDROLOGY ASSESSMENT OF RIPARIAN FLOODPLAIN WETLANDS ABOVE POWER DAM FRANKLIN COUNTY, VIRGINIA

U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061

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INTRODUCTION

The purpose of this assessment was to determine the extent of hydrologic connectivity between the impoundment behind Power Dam and an adjacent riparian or floodplain wetland in Franklin County, VA. Aerial photography suggested a 9.8 acre wetland just upstream of the dam was connected hydrologically to the impoundment by a small channel or ditch (Figure 1). If the two water bodies were connected then Power Dam could be maintaining water levels in the impoundment and the wetland; and any proposed alterations to Power Dam could result in the draining of the wetland. Staff from the U.S Fish and Wildlife Service Virginia Field Office performed a site assessment and topographical survey on April 16, 2013 to determine the extent of impacts to the wetland resulting from the impoundment associated with Power Dam being permanently lowered. Results indicate the wetland is perched above the impoundment and water levels in the wetland are maintained by elevated land forms between the two water bodies. The ditch between the impoundment and wetland was non-functional being elevated above the impoundment and filled with organic and woody debris.

METHODS

Assessment staff performed field reconnaissance and topographical surveys on April 16, 2013 at the Power Dam site off Route 713 on the Pigg River in Franklin County, VA. Point and transect data were collected using a Topcon laser level, survey rod, and receiver to an accuracy of ±0.05 feet. The entire area between the Pigg River channel (impoundment) and adjacent wetland was traversed by foot to a distance of approximately 1,800 linear feet upstream of the dam and inspected for potential hydrologic connections between the 2 water bodies. Point data included water surface elevations and depths within the impoundment, riparian wetland, and pool below dam; as well as the invert of the point of discharge between the impoundment and wetland, top of dam, and top of bank. The riparian wetland was characterized by a center of open water ringed principally by black willow (*Salix nigra*), river birch (*Betula nigra*), boxelder (*Acer negundo*), and American sycamore (*Platanus occidentalis*).

RESULTS

No direct hydrologic connection between the impoundment behind the dam and the riparian wetland was observed. Survey data indicated pool elevation of the wetland was perched 1.5 feet above the water elevation of the impoundment and the channel between the 2 water bodies seen in the aerial was found to be dry and filled with organic and woody debris (Figure 2). Water from the riparian wetland was discharging from the north end near the dam. The invert of the discharge point was 1.2 feet above the elevation of the impoundment and 1.5 feet above the top of Power Dam. There was 22.3 feet of head created by the dam of which 16.8 feet had been reduced by sediment deposition. Evidence of past flow (leaning vegetation, flotsam stuck in branches, mud deposits and scour) spilling over into the riparian wetland from the river, presumably during floods, was observed at the south end of the wetland (Figure 1).

CONCLUSION

The riparian floodplain wetlands will not be negatively impacted or drained by the lowering of the impoundment behind Power Dam. Normal pool and seasonal high flood elevations in the wetlands are sufficiently above the elevation of the dam and impoundment to conclude separate hydrologic controls exist. Discharge from the wetland was observed spilling into the impoundment behind Power Dam. Depth and duration of flooding is not likely to change since the two water bodies are maintained by separate controls. One control being the dam and the other an elevated land mass or berm between the wetland and the impoundment. Aerial photographs demonstrate a ditch, probably created in an attempt to drain the wetland, existed between the two water bodies but it has not been maintained and is no longer functional.

It is reasonable to expect a reduction in the frequency of wetland flooding from less overtopping of the banks during floods after Power Dam is altered, assuming groundwater is not a primary water source,. A reduction in flood frequency is expected to decrease the number of times per year the wetland floods and increase the periodicity of drawdowns. This is expected to improve habitat functionality resulting from increased vegetation growth and density within the open pool portion of the wetland. Functional habitat for aquatic dependent amphibians will likely increase from reduced predation by fish, and wading bird foraging may increase the concentration of prey items during drawdowns. Any effects to the wetland from a change in flood frequency and the lowering of the impoundment behind Power Dam are expected to be temporary and not result in a loss of wetland extent, type, functions, or values.

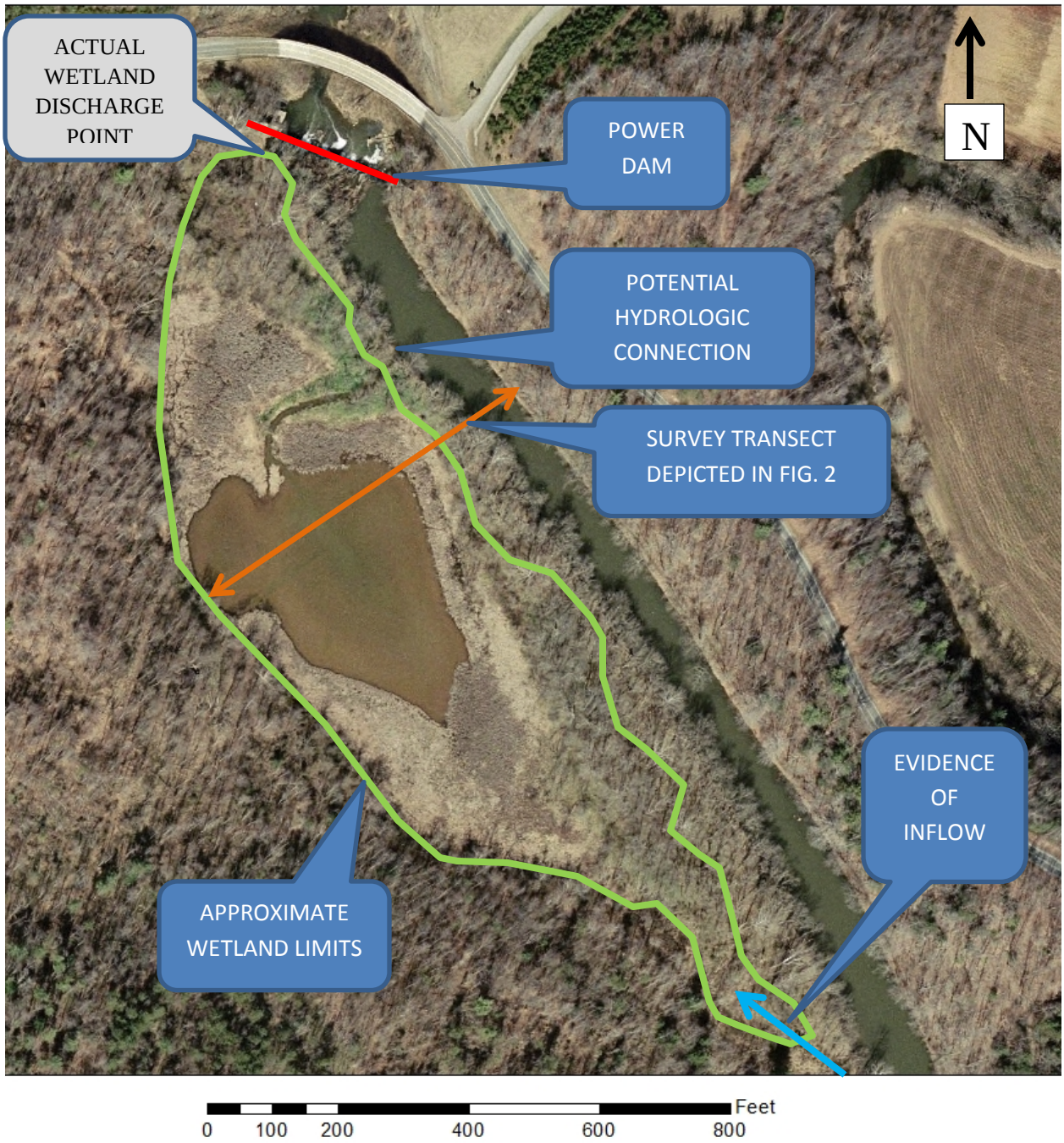

Figure 1. Riparian wetlands associated with Power Dam with survey transect location.

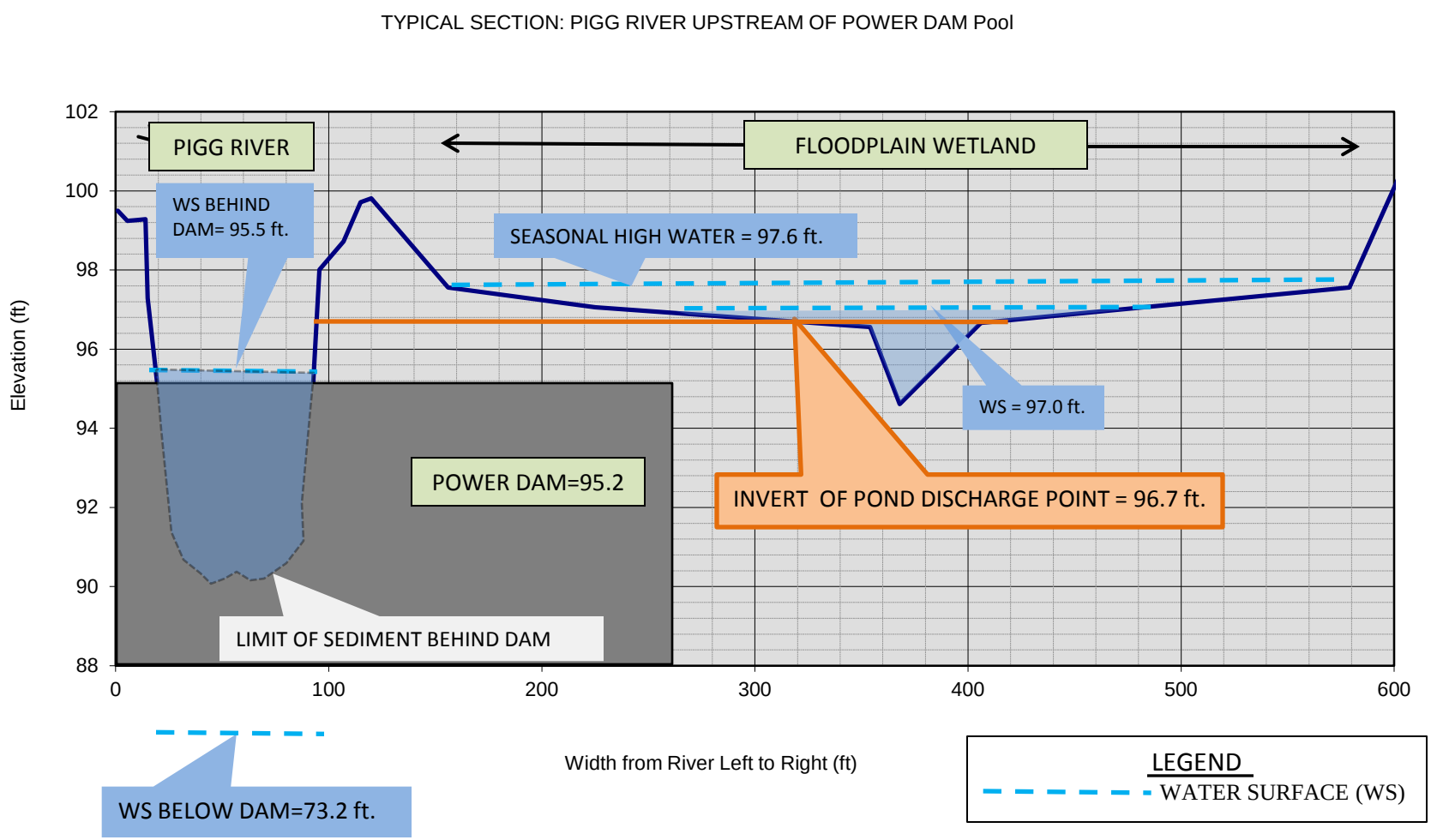

Figure 2. Cross-section of Pigg River and adjacent wetland with associated water elevations. Survey conducted April 2013.