**The Removal of Dams**

Dam removal has become an increasingly common practice to achieve multiple social and environmental goals. Dam removal is important to improve public safety by removing hazardous structures from rivers and reducing the risk of failure and flooding. Dam owners often choose to remove their dams to eliminate the liability and the financial cost of periodic inspections, maintenance, repairs and required upgrades. Dams are also being removed to restore the movement and migration of fish and other aquatic organisms, to enhance and reconnect isolated populations and habitats, to restore the natural transport of sediment, to improve water quality, and to restore wetlands and floodplains. In this way, dam removal is an environmentally-sound activity that also makes economic sense.

There are over 1,700 registered dams in NJ, and over 14,000 in New England. Some dams do provide essential social services like hydropower, irrigation, drinking water, flood control, and recreation, but most of the dams in the northeast US do not provide any beneficial services at all. All dams are commonly thought to help with flood control but in fact, most dams were not built for flood control and often make local flooding worse. According to American Rivers, 1,300 dams have been removed in the US since 1912, and 62 dams have been removed in the US in 2015 alone; dozens of dams have been removed in New Jersey.

**Environmental Benefits from the Removal of Lake Hudsonia Dam**

The removal of Lake Hudsonia Dam has been designed in concert with a restoration component that is designed to optimize environmental benefits to the Hibernia Brook system. Hibernia Brook is a freshwater, non-trout producing, C1 stream (FW2-NTC1). Lake Hudsonia is typically 6 feet deep and likely contributes to elevated water temperatures, due to direct insolation, that is exported to downstream reaches. Anticipated benefits include: 1) restoration of a man-made impoundment to a free-flowing stream bordered by riparian floodplain wetland community, 2) increased flood storage capacity of the Hibernia Brook corridor, 3) improved water quality of the C1 stream through enhanced removal of in-stream pollutants by the restored riparian floodplain wetland, 4) reduction in summer in-stream water temperatures, 5) re-creation of stream habitat in the former impoundment, 6) restoration of fish passage and movement of other aquatic organisms, and 7) re-connection of formerly isolated populations and stream habitats upstream and downstream of the dam.

As part of the restoration element of this project, the lake bed will be reshaped to reestablish a geomorphically appropriate stream channel, to re-naturalize grades, and to re-establish vegetation. Accumulated sediment will be moved within the impoundment and be placed along the eastern shoreline, which is nearly vertical along the existing edge of water, to re-naturalize grades and create a gradual transition from the proposed floodplain wetland to the existing surrounding grades. Impounded sediments were sampled and analyzed for NJDEP Soil Remediation Standards (Residential, Non-Residential, and Impact to Groundwater) and determined to be suitable to remain onsite.

The proposed design to remove Hudsonia Lake Dam is focused on the restoration of Hibernia Brook and its floodplain to a native riparian wetland plant community. Initially the impoundment area is to be

planted as an emergent wetland community with scattered patches of shrubs in order to stabilize the site. Over time, the site is anticipated to develop into a forested plant community similar in composition to the forested wetlands that currently surround the site. This restoration project seeks to convert the artificial impoundment of Hibernia Brook into a freshwater wetland complex of emergent and scrub/shrub wetland. Additional information has been provided in the application simultaneously submitted to the NJDEP LURP for GP 16 and GP 18.

*Figure 1. The re-establishment of vegetation and a meandering stream in a former impoundment approximately one year after dam removal that occurred naturally without sediment dredging or planting. A similar transition is expected at Lake Hudsonia but the process will be further facilitated by active sediment dredging, channel creation, and planting.*

The proposed construction sequence includes controlled dewatering and water handling to minimize the export of impounded sediments during construction so as not impact downstream reaches and lake communities. Several timing restrictions have been applied in accordance with guidance provided by New Jersey Fish & Wildlife to protect sensitive species.