

Barnum Lake

Background, Long Term Issues & Trends

- Barnum Lake is shallow throughout and receives urban runoff via Weir Gulch, which originates in Lakewood.
- Urban runoff is typically high in nutrients (bank erosion, fertilizer runoff from turf management), bacteria, suspended solids, and can have elevated contaminants from paved surfaces.
- In past years the lake has had periodically elevated bacteria (*E. coli*) and low dissolved oxygen. Monitoring data suggests that watershed management efforts have helped mitigate *E. coli* levels (see figure below).



Developing Issues

There have been **multiple activities** in the Barnum Lake watershed the past few years that can impact water quality: diversion of storm runoff from Federal Blvd to the lake via a **wetland (2011)**; on-going improvements in the upstream **Weir Gulch drainage**; and a **drawdown** of water to accommodate 6th Avenue construction (2013/14).

The **drawdown in 2013/14** likely had mixed impacts on water quality through exposing organic, normally anaerobic (lacking oxygen) sediment to air. This can expedite breakdown of organic matter (good for water quality), while it also allows for non-aquatic vegetation to proliferate in the dry lake bed. Upon re-flooding, this vegetation will die and contribute to organic loads within the sediment and water column (not so good).

A **2011 renovation** increased storm drainage with runoff routed from Federal Blvd to the lake via a wetland/forebay complex on the east shore. This additional water flow should improve water exchange within the lake, while the wetlands mitigate incoming contaminants.

Implemented and planned **Weir Gulch channel improvements** in the residential parkway upstream of the park should help improve lake conditions through decreased erosion and subsequent deposition of sediments and contaminants into the lake.

Fish, Wildlife, & Habitat

Fish: Barnum provides marginal fish and fishing habitat due to shallow depths, warm temperatures, and poor water exchange.

Wildlife: Among Denver's lakes and ponds, Barnum provides some of the best feeding habitat for wading and shore birds within the city. This is attributable to the mudflats associated with the islands which were established as part of a 1998 renovation.

Habitat: Extensive perimeter cattails and bulrush provide habitat for a variety of waterfowl and other wildlife (wading birds, turtles, frogs, fish). This was enhanced with addition of the east side wetland in 2011.

Beaver have set up lodges on the islands over the past several years. Unfortunately they often encounter health problems which may be attributable to marginal quantity and quality of food supplies.

High growth of rooted aquatic vegetation and algae (more typically filamentous form) are common in the lake.

Recommendations

- Determine an effective means to minimize stagnant water in portions of the lake (i.e., mixing, aeration);
- Improve flow at Weir Gulch entry to lake (re-grade lake bed, forebay improvements, longitudinal mixing);
- Assess effectiveness of wetland/forebay complex towards mitigating storm runoff entering from Federal Blvd; and
- Control filamentous algae and vegetation, but not to the extent that planktonic algae (floating algae) will proliferate.

Location: Barnum Park @ 3rd Ave & Hooker St
Surface Area: 4.2 acres
Max Depth: ~7 ft
Primary Source Water: Weir Gulch; urban and storm runoff
Intended Lake Uses: Flood control; wildlife and aesthetics; fishing
Current Regulatory Issues^{1/}: Dissolved oxygen

1/ Conditions exceeding state water quality standards.

Updated March 2016; questions to: alan.polonsky@denvergov.org

