Clark Fork Drift Facility Update

Presenter:

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US Army Corps of Engineers

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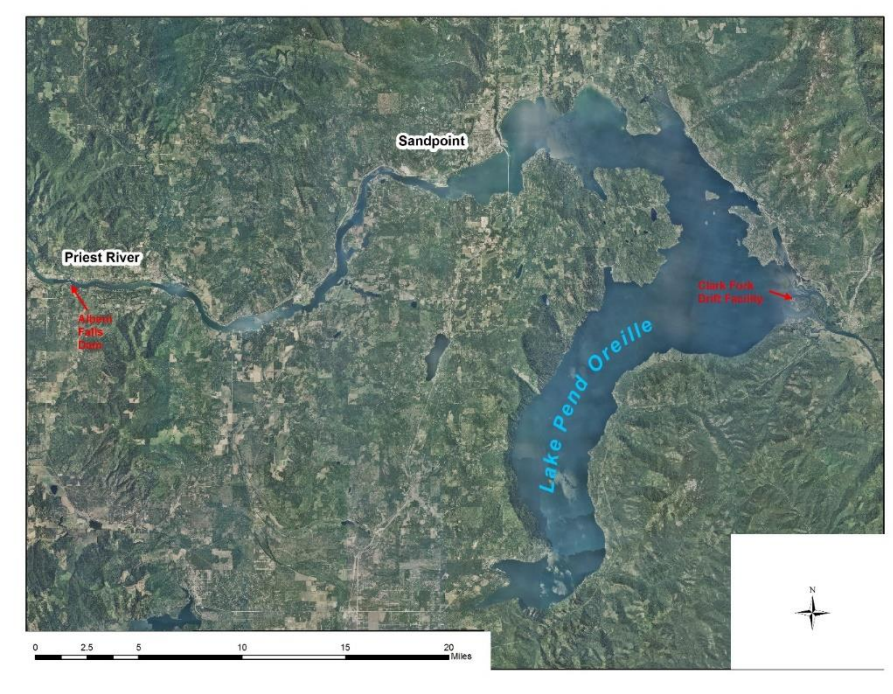
Background

- Construction completed in 1955 to reduce debris load

- WHY? After construction of the dam the lake levels remained higher longer causing navigation hazards for lake users due to debris floating in the system.

- The debris booms consist of sections totaling approximately 6,400 linear feet of shear booms in three (3) different locations beginning at the mouth of the Clark Fork River and ending at the debris collection holding area further north.

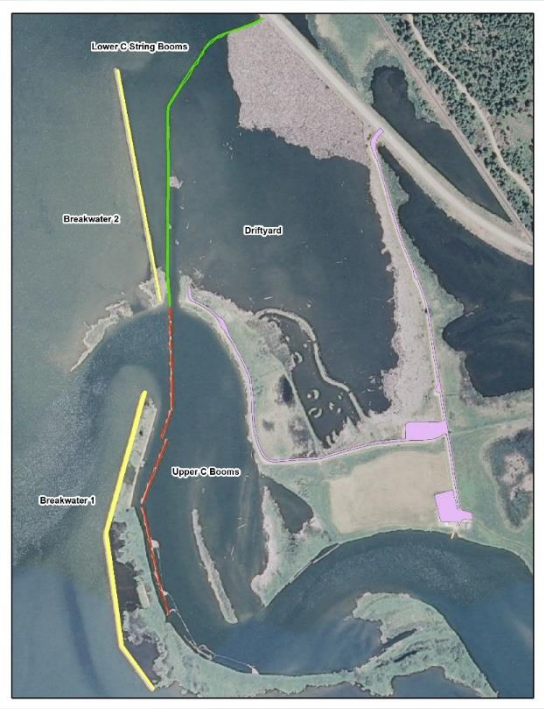


System Overview

Upper and lower A Booms, segmented to allow boat passage. Directs current and drift from the main stem Clark Fork River into the north branch.

B Booms prevent drift from entering into a secondary channel; C Booms direct the drift into the holding facility. Breakwaters protect a portion from wind fetch.

Lower C string booms contain drift in the driftyard (drift holding facility). Drift floats in the facility at summer pool, and is grounded when the area is dewatered in winter.



System Components

Dolphin – set of three pilings downstream of booms, made of steel, wood or plastic.

Shear boom – four sets of logs overlayed with connecting planks and hardware, wing sections that extend beyond downstream pilings. 100 to 200 feet in length. Diverts debris into holding facility.

String boom – single logs set end to end and chained together, connected to individual pilings. Used in low flow areas for directing drift and in the holding facility for drift containment.

Piling – individual piling made of steel, wood or plastic used in low flow areas and in the drift holding facility.

Drift holding facility (driftyard) – section of lake cordoned off by string booms and pilings. Boom system directs current, which in turn carries drift into the facility.

Why are these failures occurring?

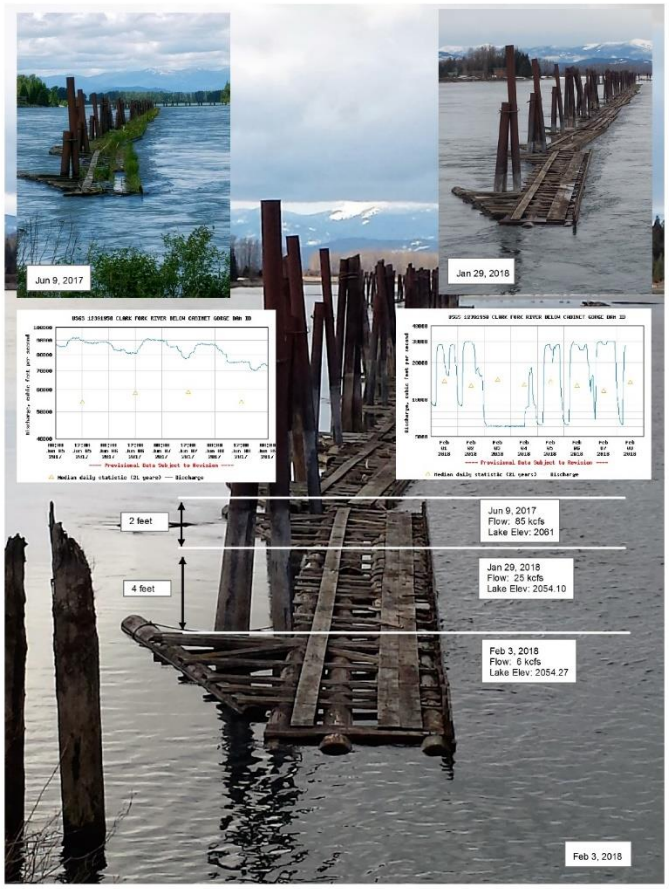
River conditions - Components are subject to operational impacts including variable flow conditions caused by upriver operating projects that change river elevations and flow conditions. Components are subject to changes on a daily basis depending on season.

Lake conditions – As lake level rises to summer pool, components become subject to wave action driven by winds and boat operations. Direct impact occurs as waves strike the components, creating associated damages.

Age – It is unknown how old all of the components are; however it is known most date to original construction. Rotting, loosening and breakage of parts, waterlogging, rusting, and vegetative growth contribute to deterioration of components.

Weather – Components are subject to variable weather conditions including air temperature ranges between -20 and 100 degrees F, water temperatures between 34 and 76 degrees F, rain, snow and icing conditions, variable snow loads and UV deterioration.

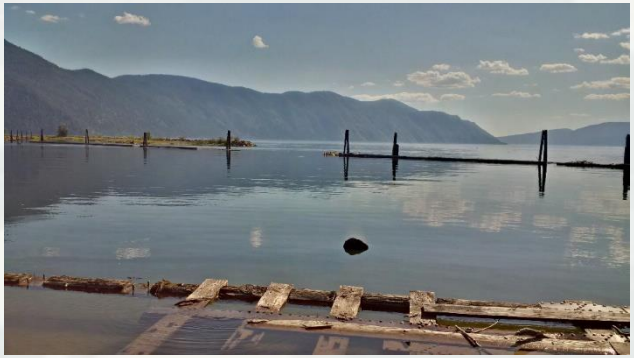
Vandalism – Components have been repaired that appeared to have been damaged by vandalism.



System Issues

Buildup around booms increase river flow through the boom at other locations. The additional weight and flows force the boom to invert and subsequently fail.

Wing and waves cause the boom to fail due to forces on aged and fatigued parts.



System Issues

Waterlogging causes the boom to ride lower in the water, creating a condition in which drift builds on the boom instead of floating downstream the current. Weight of debris impacts boom function.

Dolphin Damage - Parts failing. Ex. One piling broke and the other two were twisted downstream. (note: This dolphin completely failed in 2017 and has been replaced)

What happens when the booms fail?

Debris release into the lake, 2016 – the boom 55 break released an estimated 100’ by 100’ (10000 sq ft) amount of material into the lake including debris ranging from sticks to logs, with an estimated 30 logs significant enough in size to be considered serious navigation hazards. Within three days the debris field had expanded into the lake to cover over 2700 acres. It is estimated that a full debris release from the driftyard, in volume of material, would be 112 times greater than that released in the June 28 event.

Plans for Repair

- Funds identified for in-house and contract repairs in FY20
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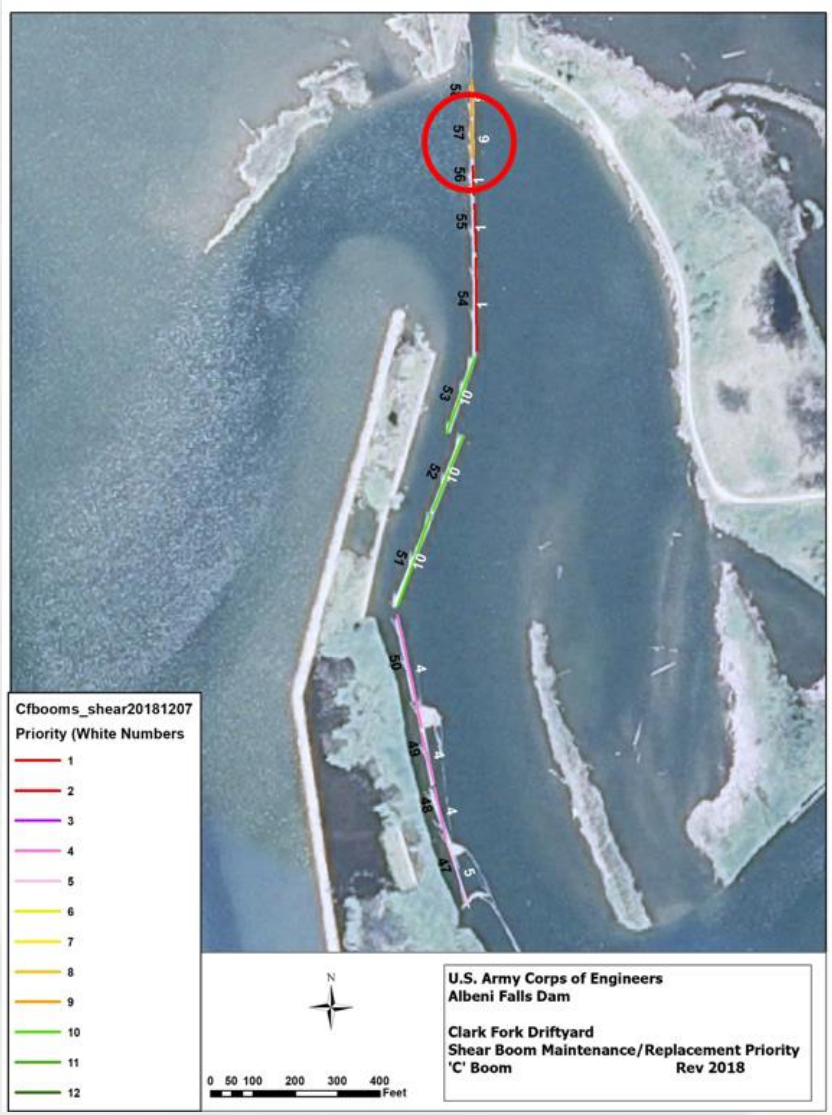
- Contract awarded SEP 19 for procurement of 225 feet of new booms
  - Multiyear procurement effort
  - Replacement strategy based on risk of failure

- Install of booms scheduled to occur in June/July 2020

- Contract scheduled to advertise and award 2nd quarter FY20 for dolphin repair with planned 3rd quarter execution

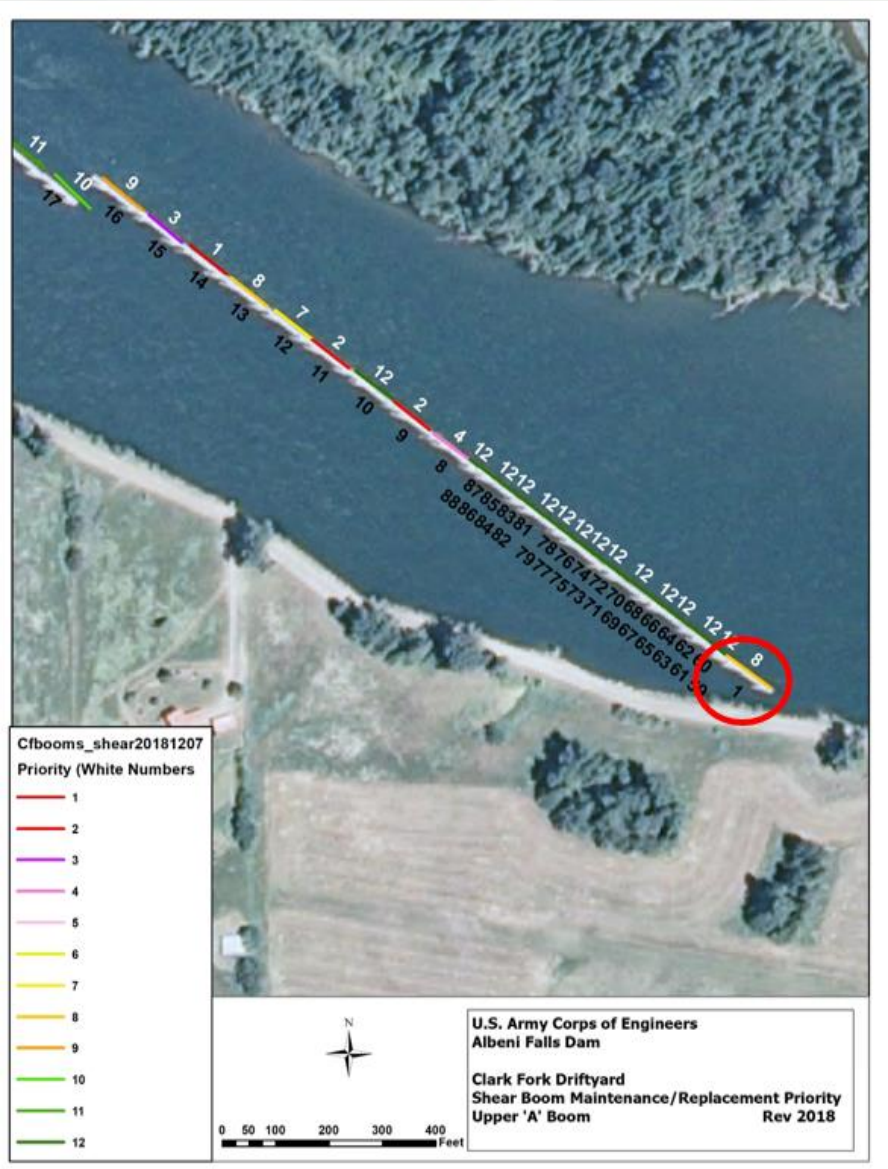
FY20 Planned Work

- 1st Priority: Upper C Boom, Shear Boom 57



FY20 Planned Work

2nd Priority: Upper A Boom, Shear Boom 1



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