

# UPDATE ON FOSTER DOWNSTREAM PASSAGE IMPROVEMENTS (FISH WEIR)

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# BACKGROUND



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- The new fish weir was installed March 2018
- Commenced post construction evaluation
- Results from the studies indicate:
  - Significant improvement in collection (attraction and passage) – we are passing more fish! ✓
  - A high rate of injury on the spillway
    - Impact of weir jet hitting spillway surface; however, improved compared to the old weir.
    - Fish tumbled/slid down the surface, leading to abrasion type injuries.
  - Similar or lower overall survival compared to the old weir
  - The engineering team (PDT) is working on design improvements



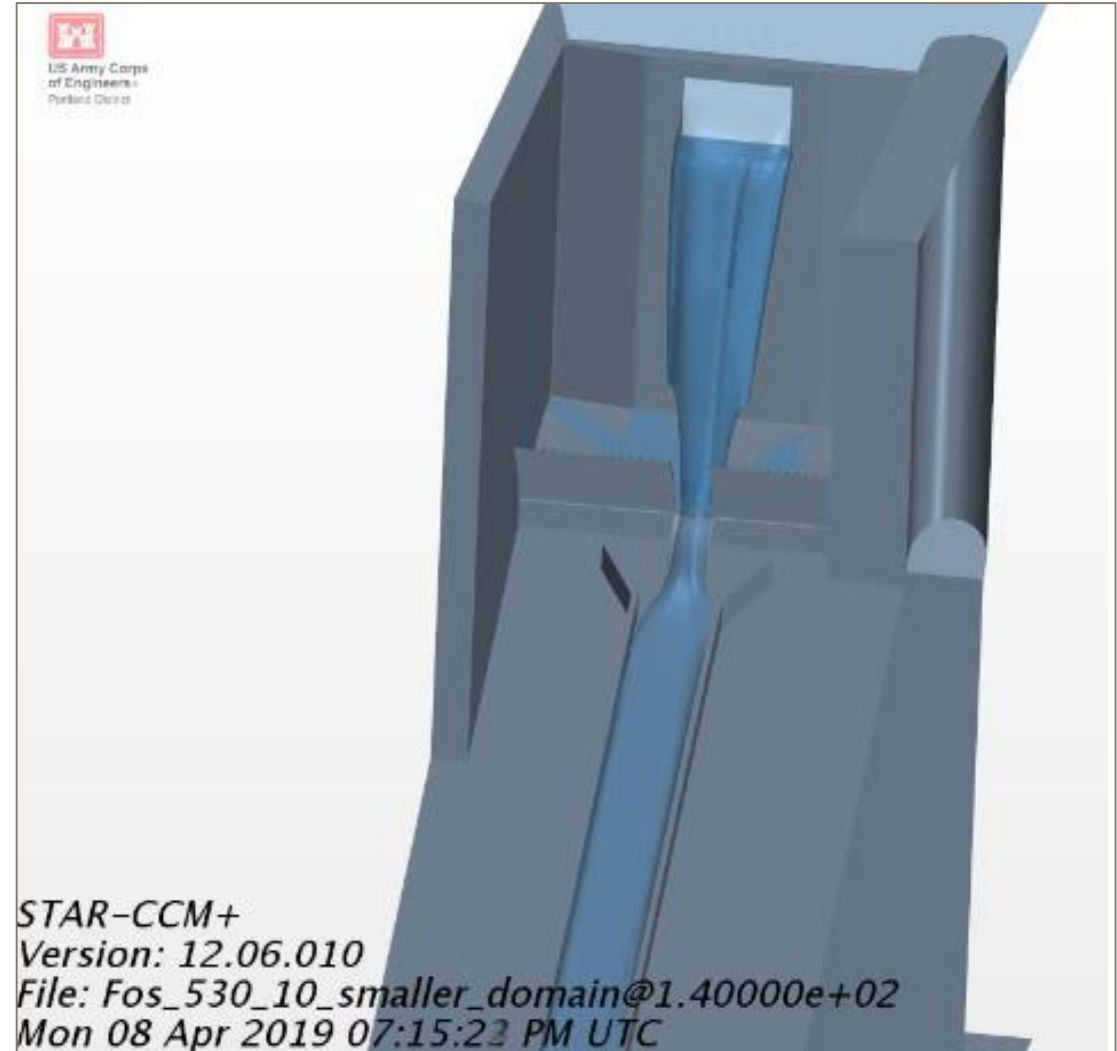
# DESIGN IMPROVEMENTS



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- The PDT brainstormed alternatives
- Dam safety requirements – spill bay must be returned to regular spill during high water events or as needed
- The solution under evaluation:
  - Create a landing pool, or jet redirection, at the bottom of the weir jet with bottom-hinged crest weirs
  - Create a channel down the spillway to maintain deeper water to prevent fish from tumbling down
  - Ongoing hydraulic modeling to inform the design



# SOME KEY METRICS



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Is the overall impact reduced from the spill hitting the spillway?

- Modeling using history probe particle tracking with mass-based particles and abrupt changes in velocity.
  - Validate with PNNL sensor fish data.

How much water is spilling over the sides of the crest weirs, and how many fish are in this water?

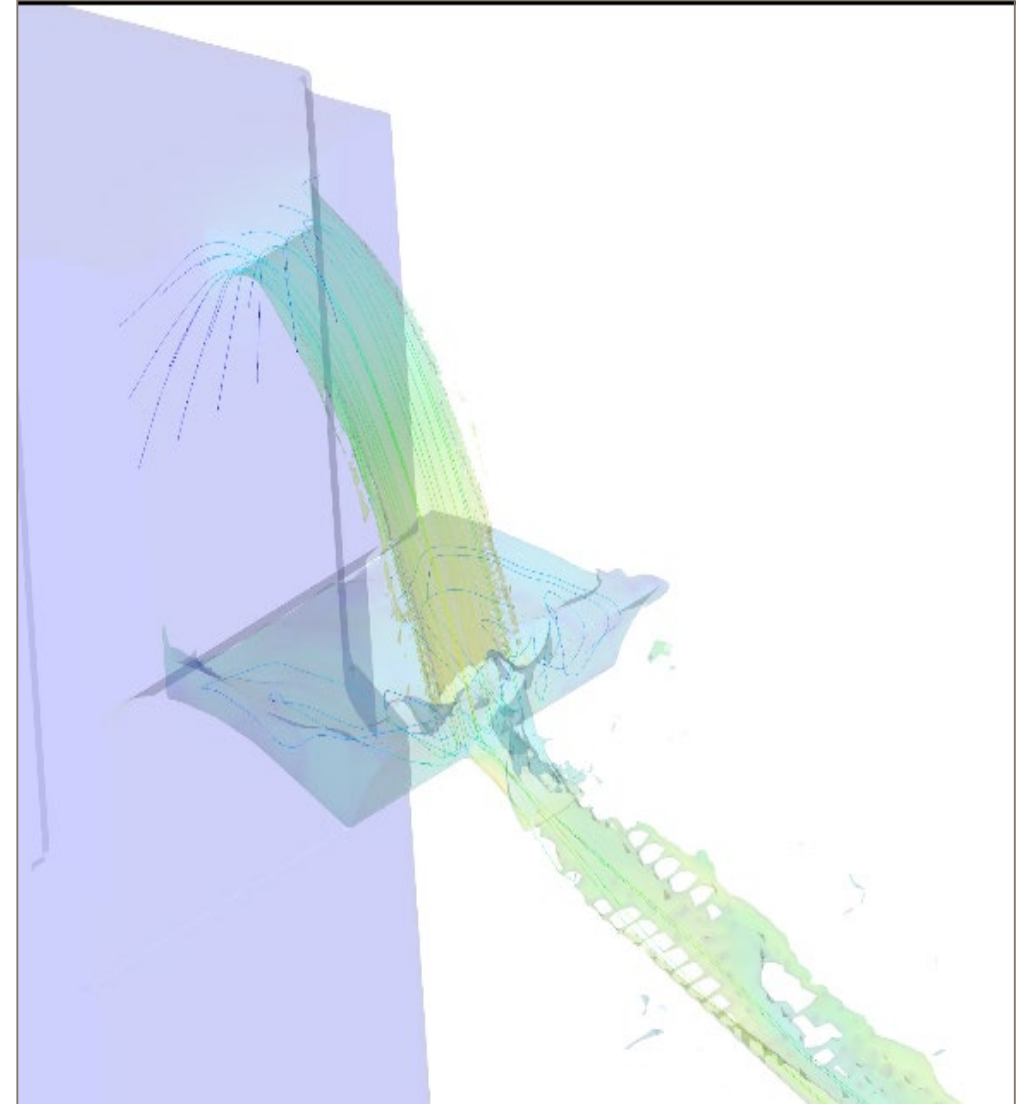
- Mass-flux boundaries over crest weirs to check for overspill, check for marker particles passing through flux planes.

Retention time of fish in created pool.

- Life-cycle time of marker particles in the model.

Hydraulic Profile Down Spillway Chute.

- Due to transition zone, looking at an adjustable or temporary channel to mitigate risk of modifications to spillway.



# FLOW-3D MODEL OF THE PLUNGE POOL



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Foster DSP  
Time = 2.999803

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