

Yellowstone River at Intake Dam Fish Passage and Entrainment Reduction

31MAR2015

U.S. Army Corps of Engineers

Northwestern Division

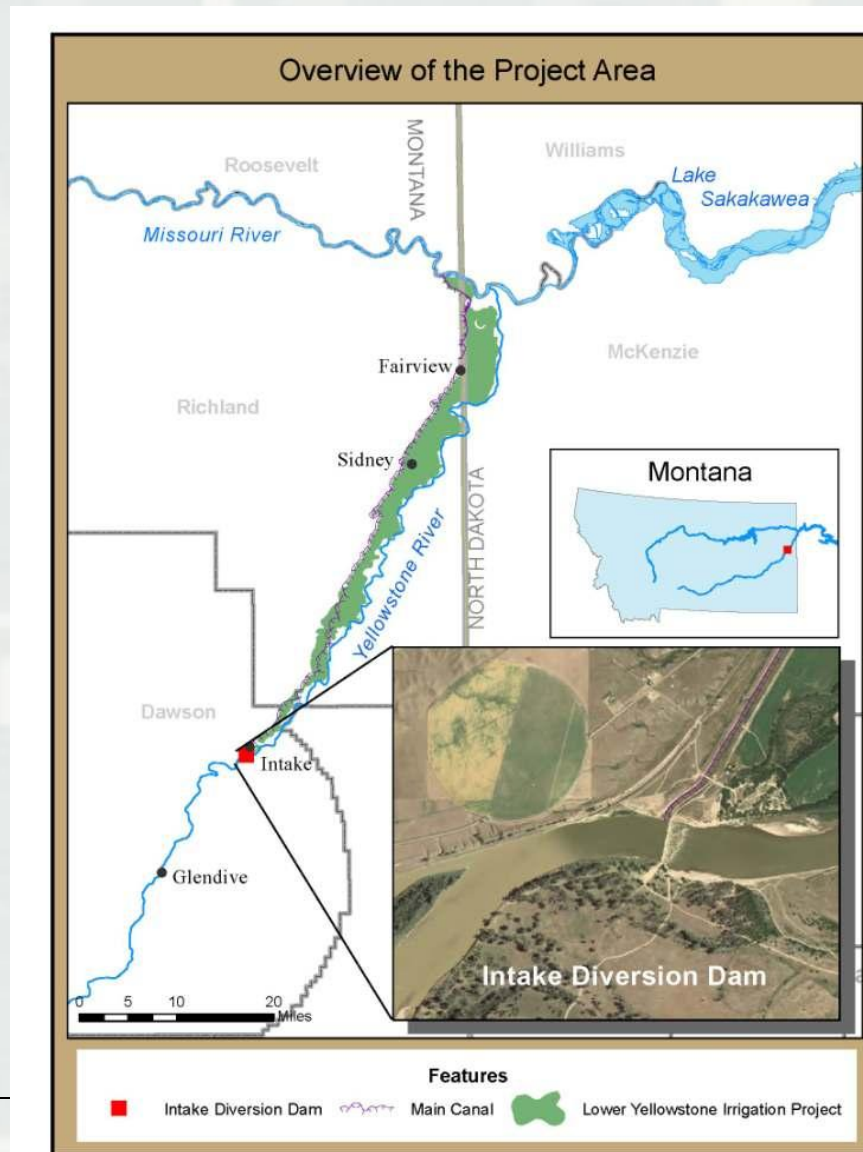
Omaha District



US Army Corps of Engineers
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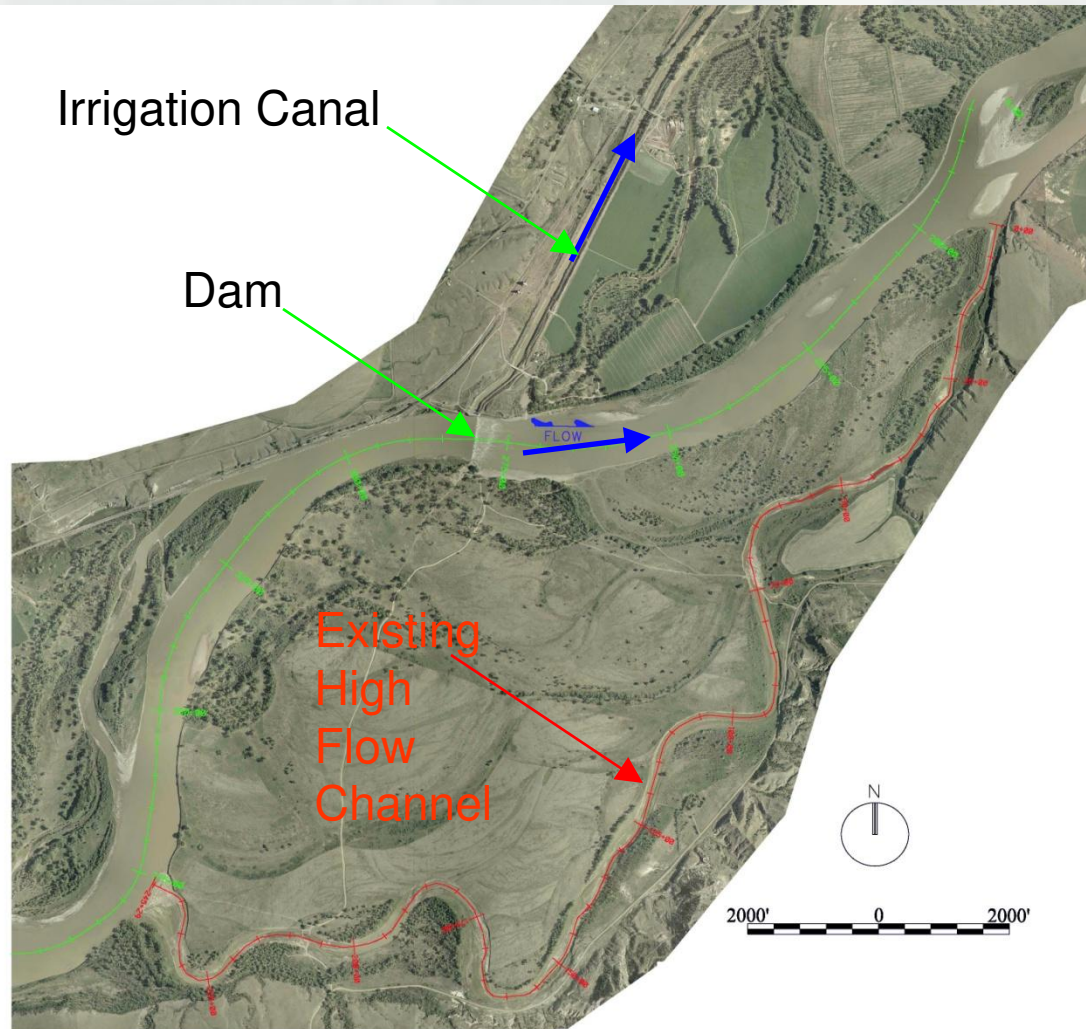


Lower Yellowstone Irrigation Project (Intake Dam)



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Lower Yellowstone Irrigation Project (Intake Dam)



Intake Dam-Overview



1910



Authorization:

Reclamation Act of 1902

Construction:

1905-08 by Reclamation

Operation:

**Diverts ~1,374cfs into
Main Canal for delivery
to ~52,000 acres**

Maintenance:

**Placement of rock on the
crest of dam to maintain
head and replace rock
washed downstream by
high flow and ice**

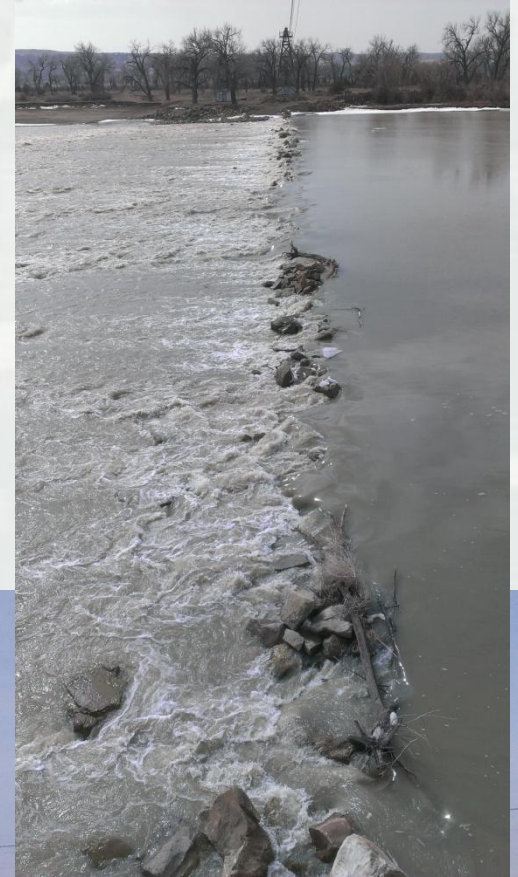


Present

Project Purpose

- Improve upstream and downstream fish passage (especially for the endangered pallid sturgeon, but also for \approx 38 other native fish species)
- Reduce entrainment into the irrigation canal (new headworks with screens – construction completed in 2012)

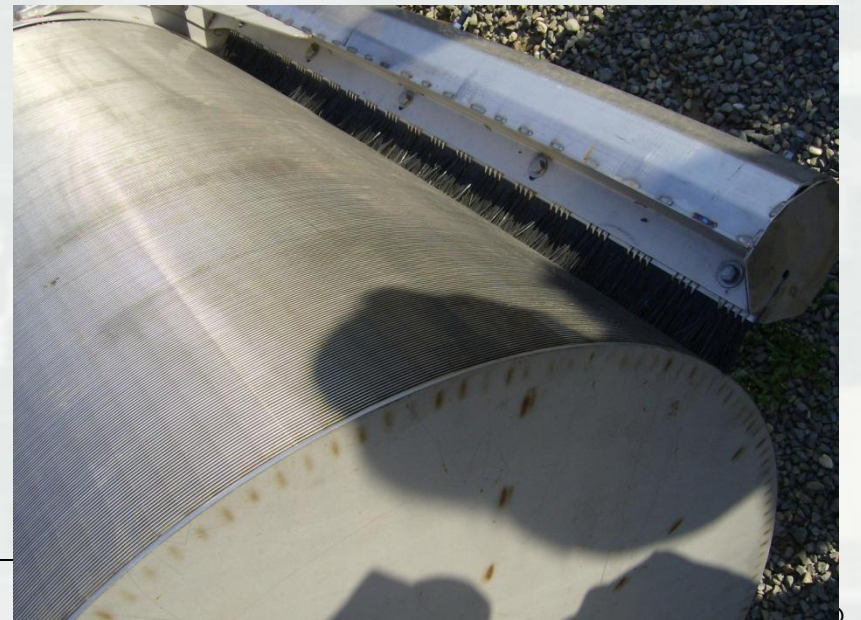
Impediment to fish passage



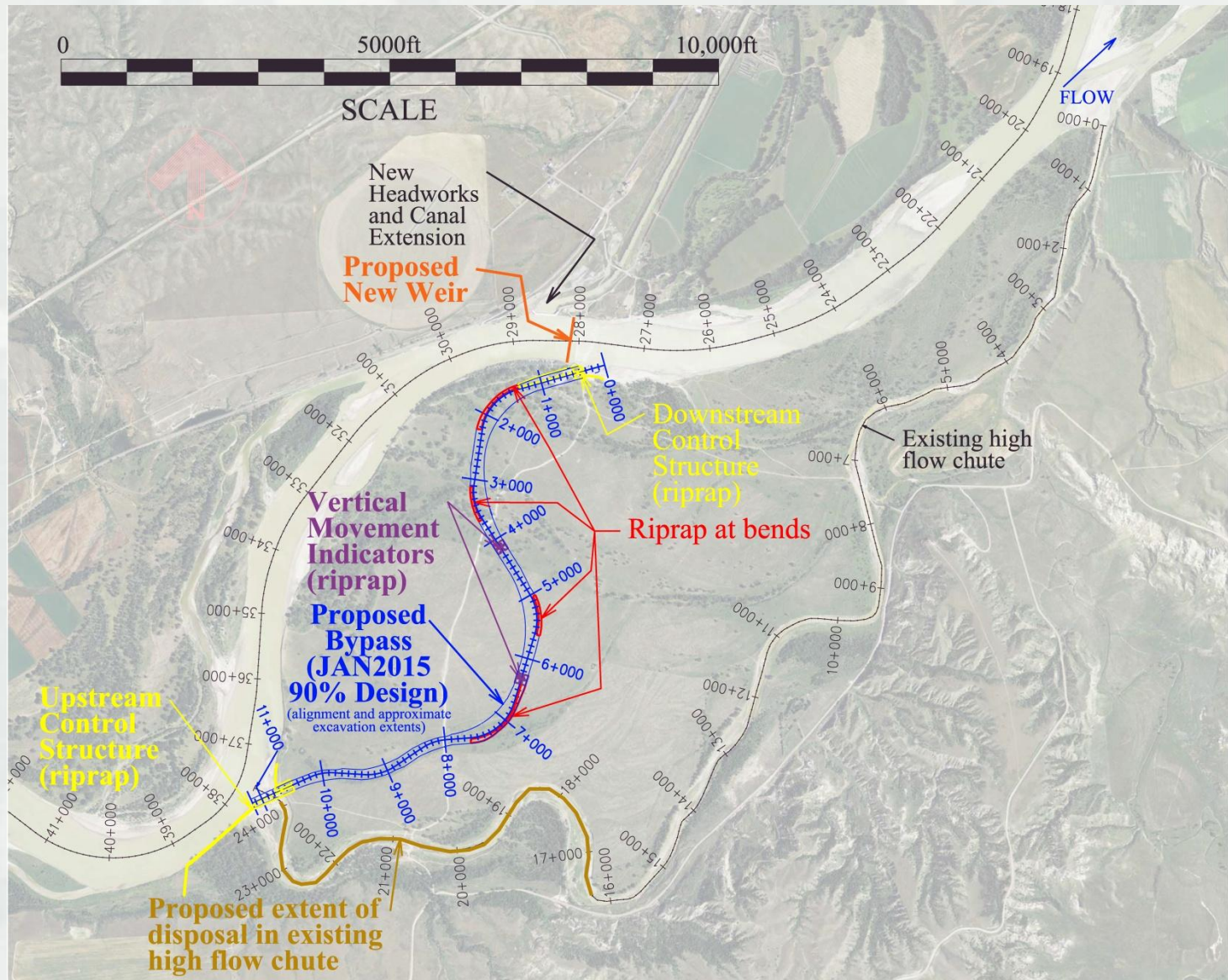
Entrainment



New headworks with screens



Proposed Bypass Channel General Overview



Weir Rendering



**LOWER YELLOWSTONE INTAKE
DEEP FOUNDATION WEIR**



Bypass channel

- Length $\approx 11,150$ ft
- Width – bottom = 40 ft, top = 150-250 ft
- Depth – 5-20ft, average of ≈ 16 ft
- Slope = 0.0007 ft/ft
- Side slopes range from 1V:8H to 1V:3H with variable cross sections to mimic natural channel
- Excavation of approximately 1,000,000 yd³



Design considerations

- Highly variable discharge
- Ice
- Sediment balance
- Balance of stakeholder's interests
 - ▶ Fish passage
 - ▶ Irrigation diversion
 - ▶ Recreation



Questions?

