Pilot Studies of Reservoir Sustainability: Yellowtail

April 14, 2016
Current Reclamation Efforts
Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

1) Further develops and evaluates reservoir sediment management options
   • FY 2017 evaluates options for controlling sediment at Horseshoe Bend

2) Investigate long term sustainability of the reservoir
   • Continued operation of Yellowtail dam for the purpose of delivering water and power into the future
Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

- Applicable and potential solutions to manage sediment while reservoirs are at normal operating levels
  1) Venting turbid density currents
  2) Altering the geometry of the upper portion of a reservoir to improve the passage of sediment downstream
  3) Dredging
  4) Other methods that manage reservoir sedimentation
Turbidity currents are important in explaining patterns of fine sediment transport and deposition in many reservoirs.

Plunge point, marked by change in water color and accumulation of floating debris as downstream flow meets the local upstream flowing counter-current created by the plunging flow.

of turbid water which has not yet settled into a consolidated deposit

Consolidated deposits from prior turbidity currents

Release of turbidity current by low-level outlet
Turbid density current running through Dos Bocas Reservoir, Puerto Rico

Turbid water exiting turbines below dam

Clear surface water

Sediment-laden water entering reservoir

Dos Bocas was built in 1942
Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

Fiscal Year 2016 ➔ Review data, plan options, collect data

Fiscal Year 2017 ➔ 2D sediment modeling of passage to increase sediment transport capacity; work with stakeholder to plan potential long-term options

Fiscal Year 2018 ➔ Develop Report and Guideline of options
Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

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Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

Horseshoe Bend

- Data collection FY 2016 if reservoir fills
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Upstream of Causeway

- Possible in the future if additional funding is obtained
# Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

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Bighorn Lake Sediment Management Study

USACE 2010

- Reconnaissance Level
- Developed Alternatives and Estimated Costs

Alternative 1: Force channel (blue) to the west side of HSB using a dike (red) constructed of rock or dredged material from the newly formed channel.
Alternatives Considered

1. Force channel to the west side of the HSB using a dike
   Cost estimate - $24 Million and up + maintenance

2. Force all flow to the east side of the HSB using a dike
   Cost estimate - $24 Million and up + maintenance

3. Sediment removal with Flow barrier dikes
   Cost estimate - $34 Million and up + maintenance

4. Sediment removal without Flow barrier dikes
   Cost estimate - $145 Million and up + maintenance
Pilot Studies of Reservoir Sustainability Options – Large Reservoirs

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Next Steps & Questions?

• Reclamation – continue the planned FY 2016 and FY 2017 efforts evaluating alternatives and looking for additional opportunities to fund research or projects

• Sedimentation Committee – reinitiate efforts on public education and continue efforts to identify funding sources