

RECLAMATION

Managing Water in the West

Fisheries Evaluation of Storage Alternatives

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June 15, 2005

Ellensburg, Washington



U.S. Department of the Interior
Bureau of Reclamation

Estimate Fish Benefit =

Number
of



Scenario

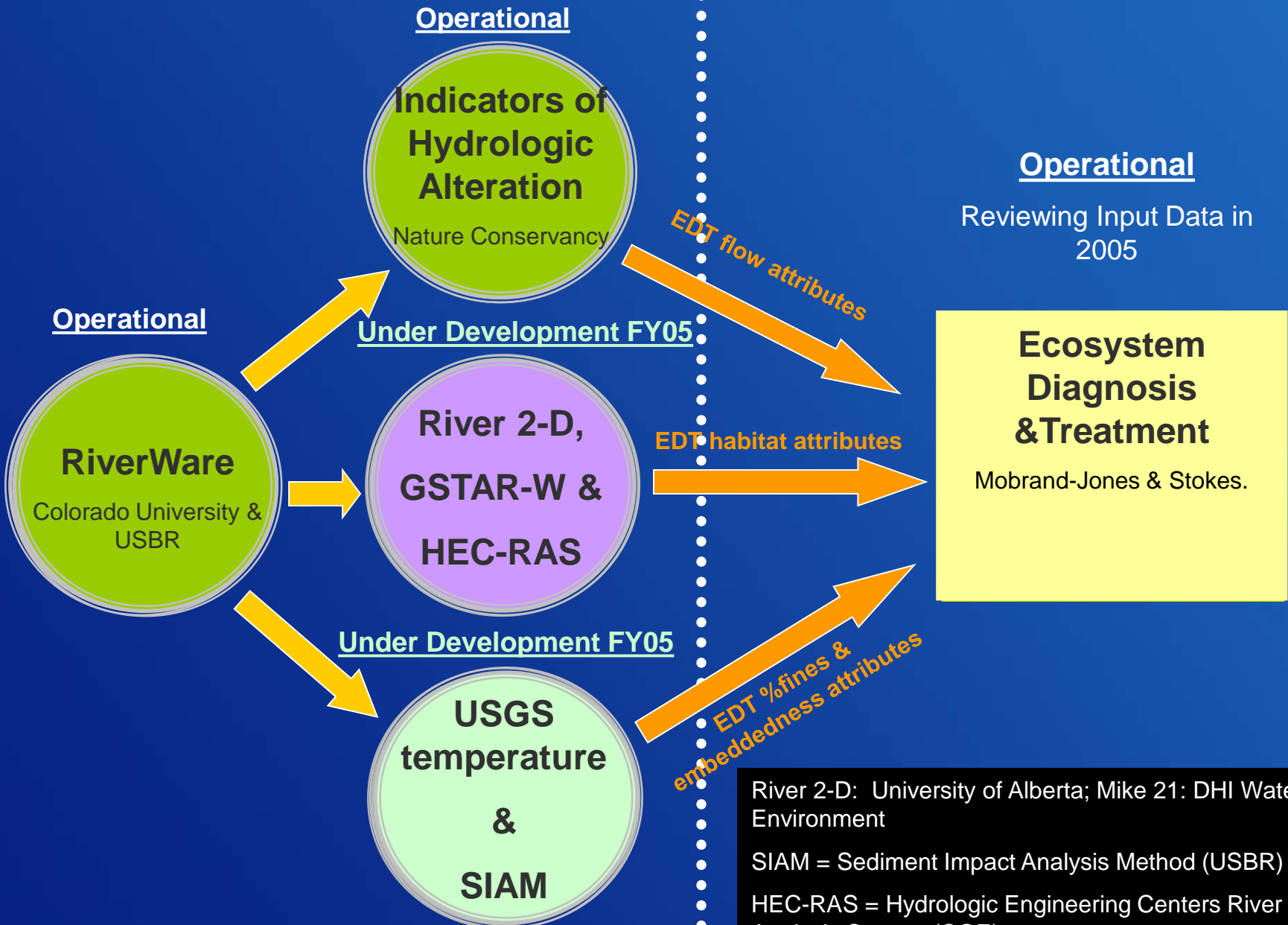
Ecosystem Diagnosis & Treatment Model (EDT)

- Abundance
- Productivity
- Life History Diversity

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Support Models

Assessment Model



River 2-D: University of Alberta; Mike 21: DHI Water & Environment
SIAM = Sediment Impact Analysis Method (USBR)
HEC-RAS = Hydrologic Engineering Centers River Analysis System (COE)

EDT Level 2 Attributes “touched” by the Support Models

IHA Model: Flow High, Flow Low, Flow Diel Variation, Flow Intra-Annual

2-D Habitat Models: Habitat Backwater Pools, Habitat Beaver Ponds, Habitat Glides, Habitat Large Cobble Riffle, Habitat Small Cobble Riffle, Habitat Pools, Habitat Pool Tailouts & **Side Channels**

HEC-RAS Model: Channel Width

Temperature Model: Temperature Maximum, Temperature Minimum

SIAM Model: Bed Scour (Embeddedness & Fine Sediments ?)

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Where?



RiverWare Model & EDT Model Reach Association

- Yakima R. at Easton
- Cle Elum R. (reservoir)
- Yakima R. at Cle Elum
- Yakima R. at Umtanum
- Yakima R. at Parker
- Yakima R. at Prosser
- Yakima R. at Kiona
- Bumping R. (reservoir)
- Tieton R. (reservoir)
- Naches R. at Cliffdale
- Naches R. at Naches

Where?



2-D Floodplains

Easton

Ellensburg

Lower Naches

Gap-to-Gap

Wapato

1-D Reaches

Where?



2-D Floodplains

Easton

Ellensburg

Lower Naches

Gap-to-Gap

Wapato

1-D Reaches

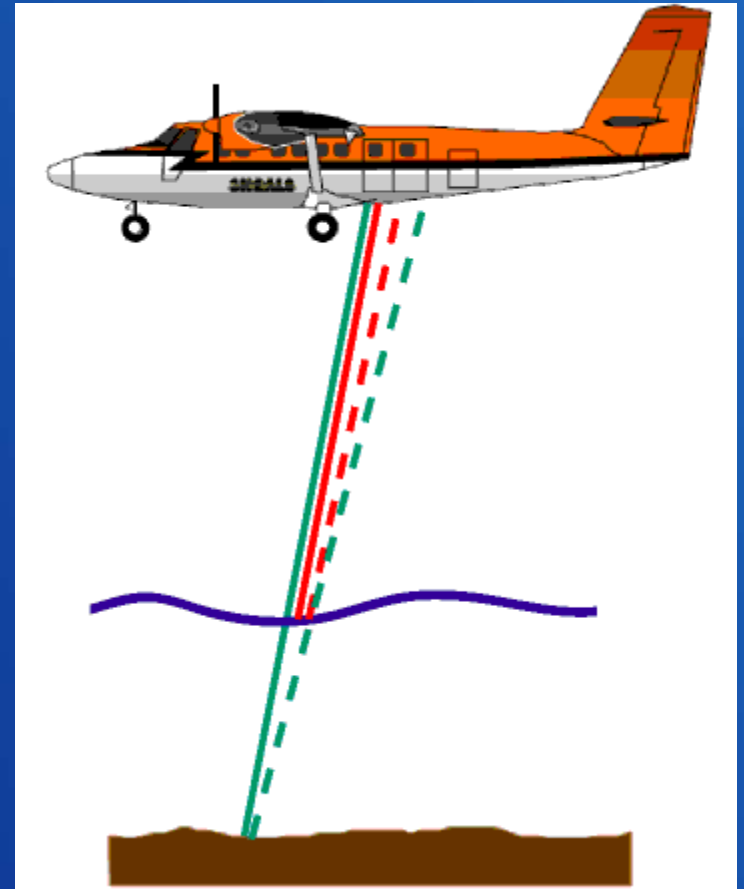
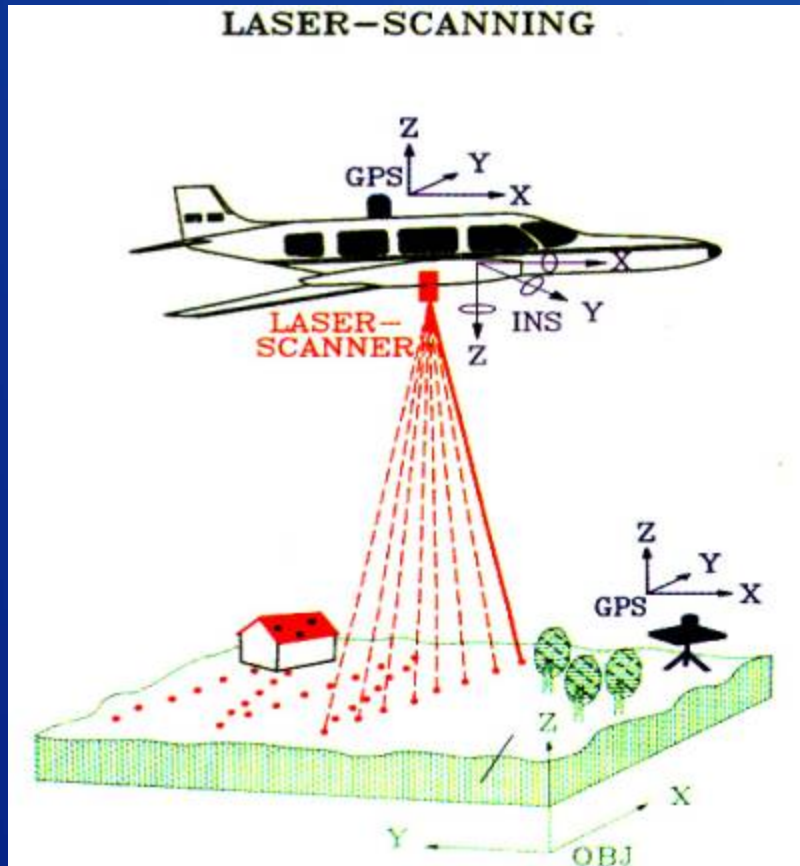
Cascade Dam - Hanson Ponds

Granger - Prosser Dam

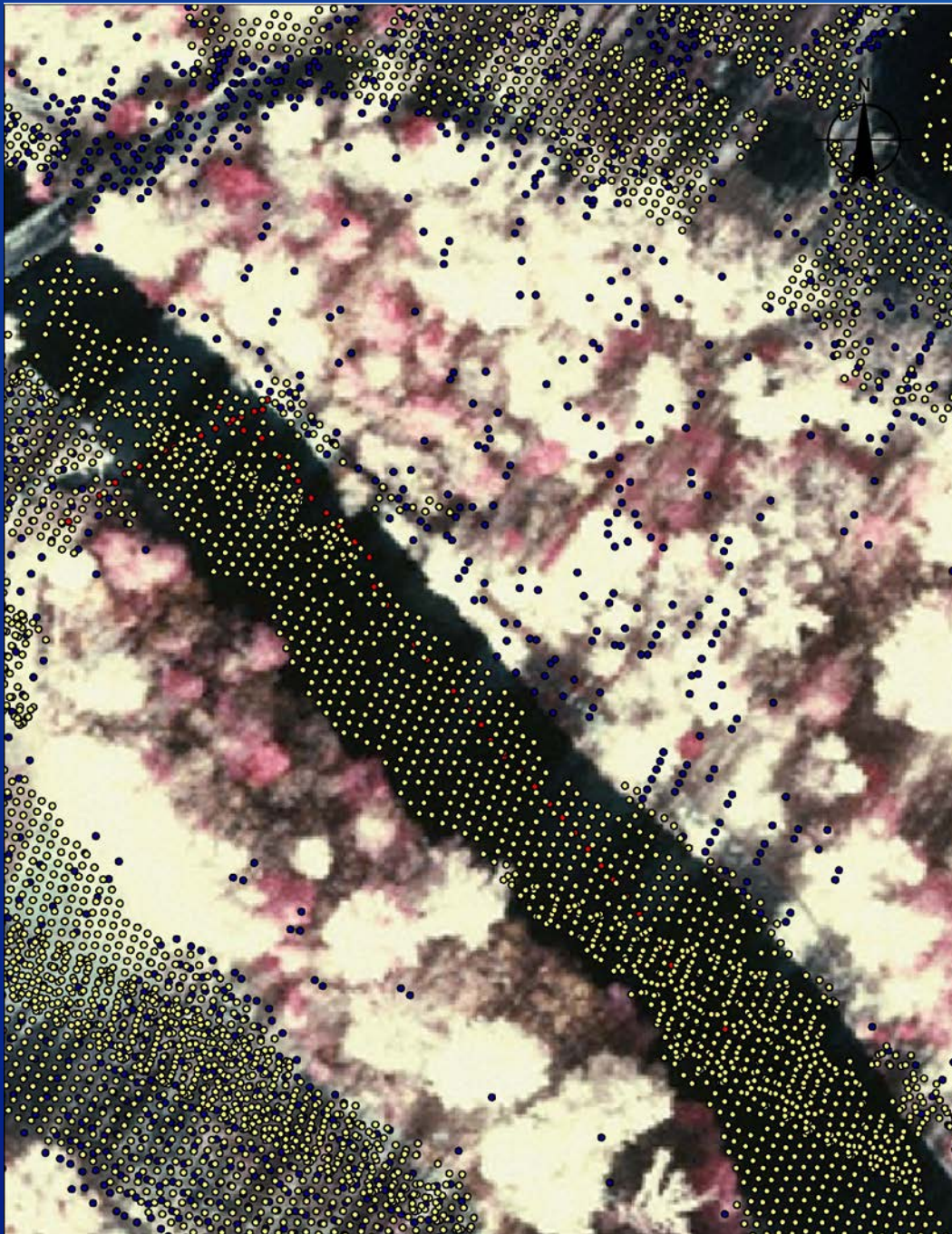
Chandler Pumping Plant Area

Bathymetric Survey Approach for the 2-D Modeling

LiDAR- (Light Detection and Ranging)



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Easton Reach

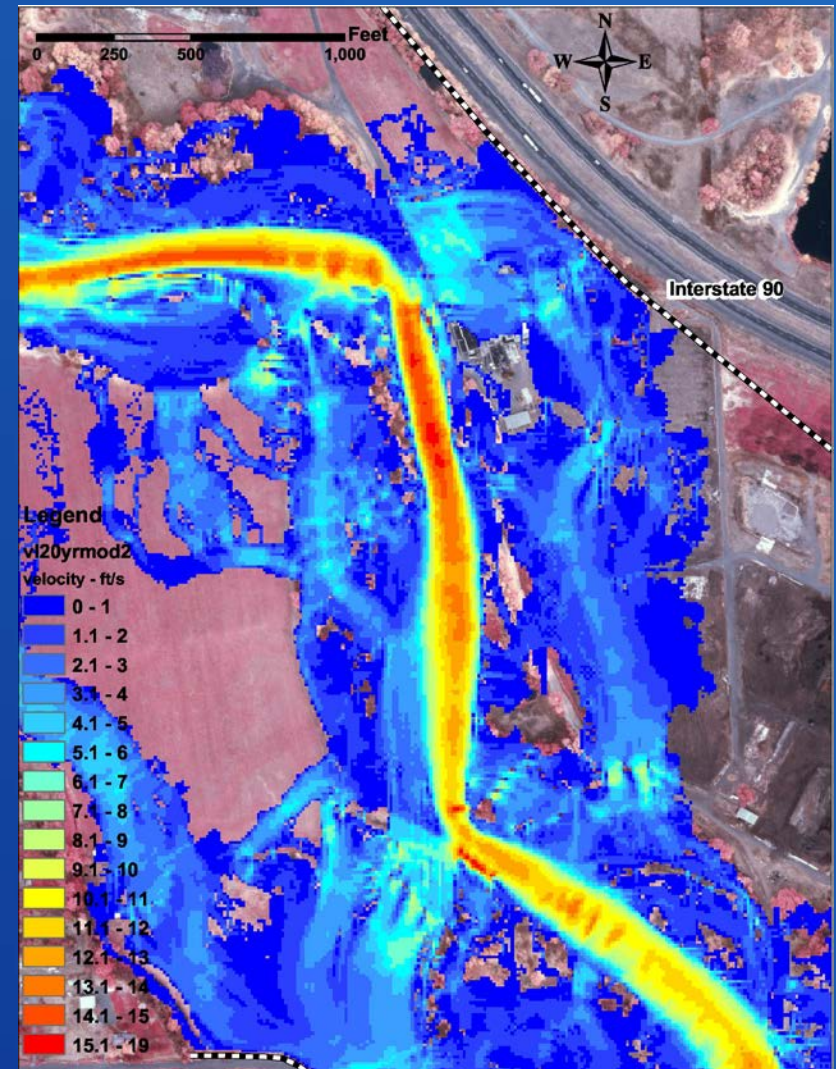
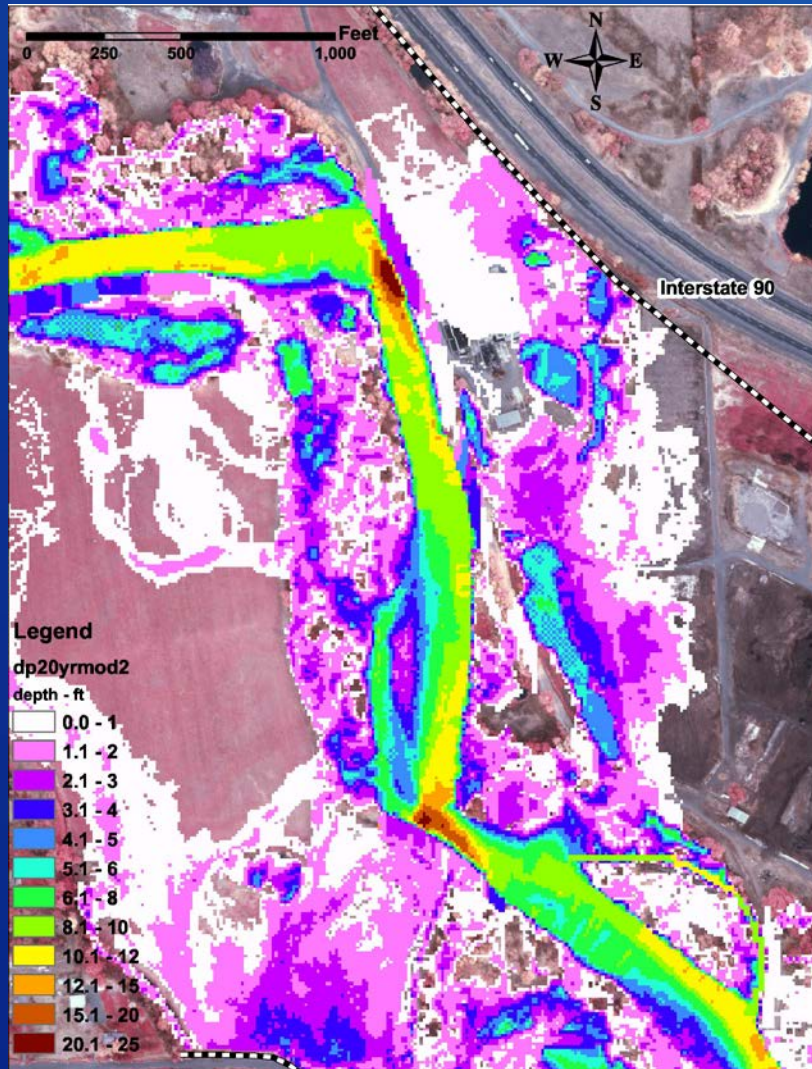
LiDAR Points

Yellow = bathymetric aerial LiDAR

Red = ground truth foot survey

Blue = terrain aerial LiDAR

Ellensburg Reach: water depth (left) & velocity (right)



Temperature Model

Where?



SIAM Model

(Sediment Impact Analysis Method)

Where?



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Where Are We At?

- Bathymetric Reach Surveys Completed (5/04, 8/04 & 5/05)
- RiverWare Model Operational
- IHA Model Operational
- HEC-RAS Model under development in FY05-06 (USBR)
- 2-D floodplain Habitat Models under development in FY05-06 (USBR & USGS)
 - Easton, Ellensburg & lower Naches (USBR)
 - Selah-Union Gap & Wapato (USGS)
- Temperature Model under development in FY05-06
 - Field data collection summer-winter
 - Model construction 1st half of 2006
- SIAM Model under development in FY05-06
 - Field data collection summer-fall 2005
 - Model construction winter 2005-06

Where Are We At (cont')?

- EDT Model
 - Model sensitivity and validation analysis completed in 2005
 - Model modifications to specified Level 2 attributes
 - Development of the data management interfaces (DMIs) completed in 2005 (support models to EDT model data transfer)
 - Review of Level 2 attributes for mainstem reaches
 - Begin EDT model runs of Storage Study alternatives in spring/summer 2006.

Alternatives Being Investigated-

- K-K Pipeline
- Wymer Dam (off channel storage)
- Bumping Enlargement
- Black Rock Reservoir
- Others?

Criteria: 1) $\geq 70\%$ pro-ration level

2) provide a more normative hydrograph over current conditions

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Alternatives Being Investigated-

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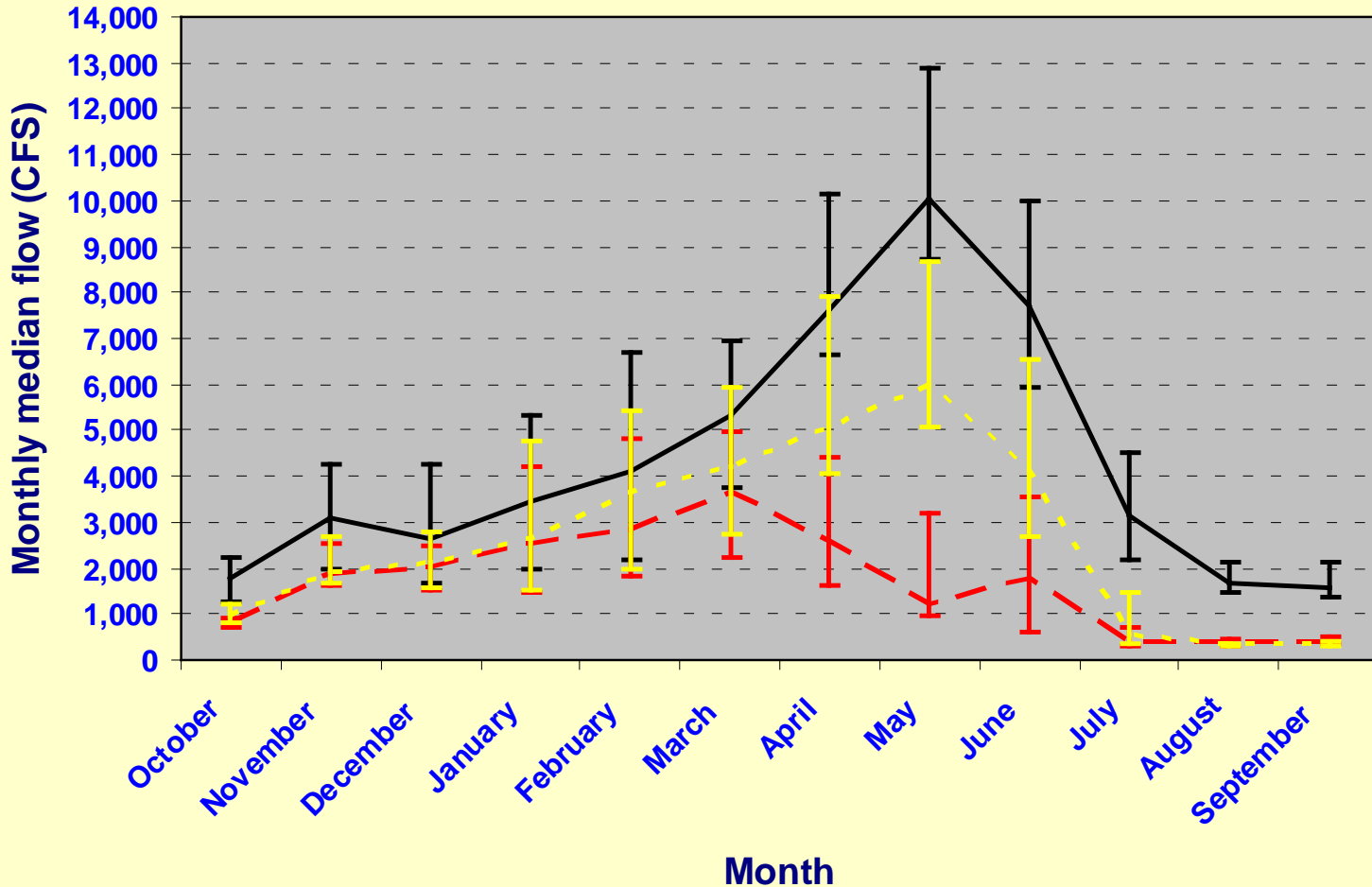
•This summer via the RiverWare & IHA models

•Alternatives carried forward into the Plan Formulation phase will be evaluated using the EDT model & support models.

Using RiverWare & IHA models To Evaluate These Alternatives

Parker gauge station (Yakima River at RM 103.7)

The error bars denote the RVA 25th-75th percentile values



— Unregulated — No Action - - - Black Rock

A graphic design featuring a circular frame with a light blue background. Inside the frame are two dark blue silhouettes of fish, one at the top and one at the bottom, facing each other. The text "The End" is overlaid in the center of the frame.

The End

DECLAMATION