DeSabla-Centerville Hydroelectric Project (FERC Project No. 803)

Habitat Suitability Criteria Development

Spring-run Chinook Salmon and Steelhead

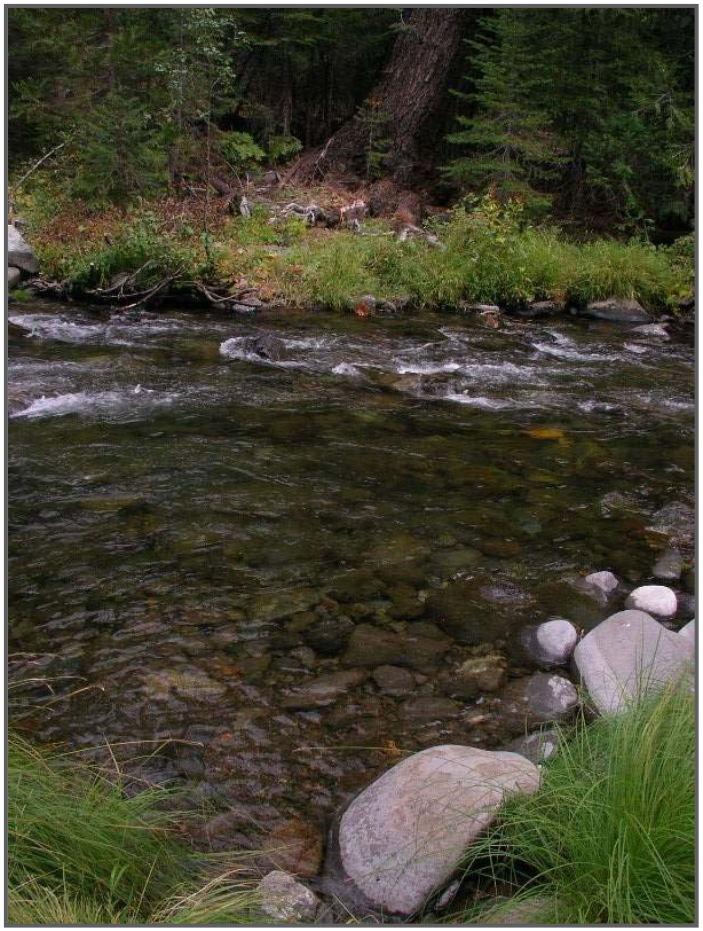
March 27, 2007

DTA, Sacramento, CA

HSC Development History

Target Species

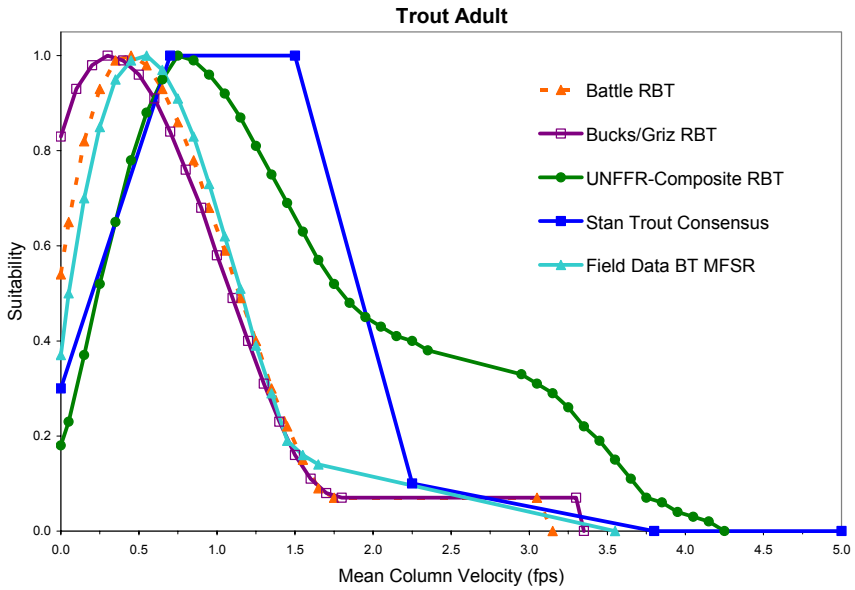
- Resident Rainbow Trout
  - Fry, Juvenile, Adult, Spawning
- Steelhead in Lower/Middle Butte Creek
  - Fry, Juvenile, Spawning
- Spring-run Chinook in Lower/Middle Butte Creek
  - Fry, Juvenile, Spawning



HSC Development History

Rainbow Trout

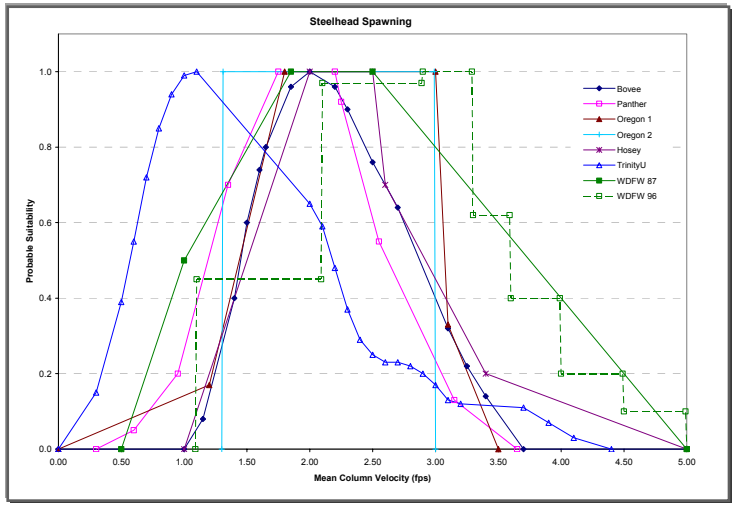
- Applying Stanislaus consensus curves
- Using depth and velocity criteria only for spawning

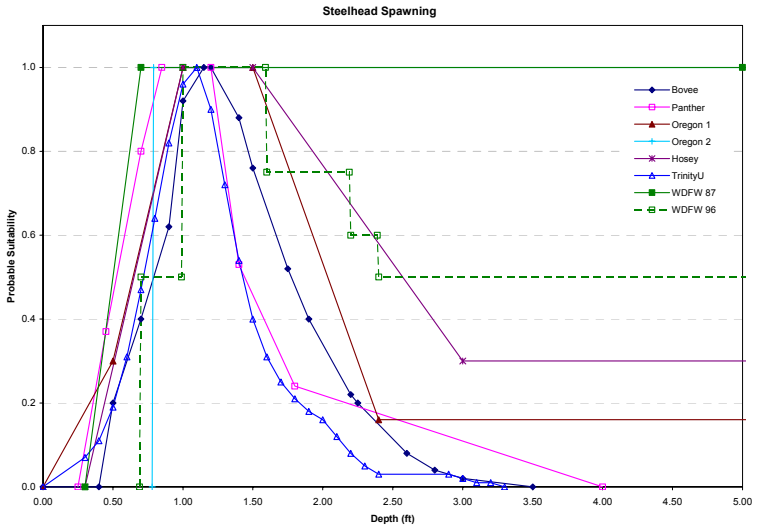


HSC Development History

Steelhead

- Planning to apply resident rainbow HSC for fry and juveniles
- Review literature for spawning criteria
- Limited field effort to collect some Lower/Middle Butte Creek spawning observations is in progress this spawning season

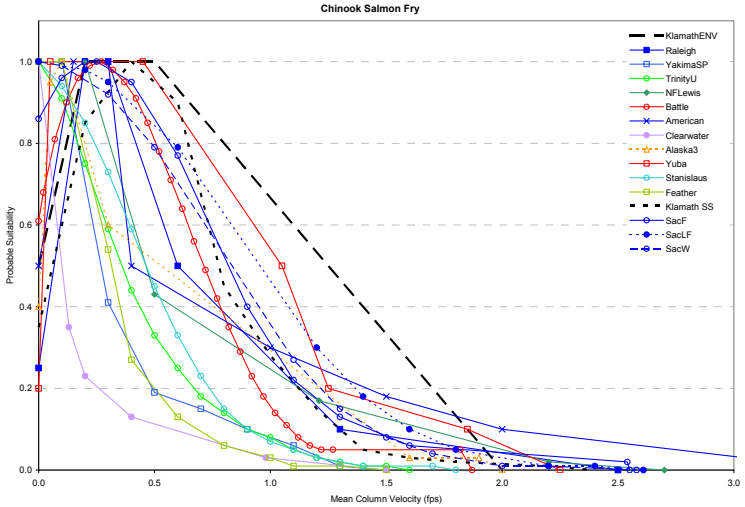


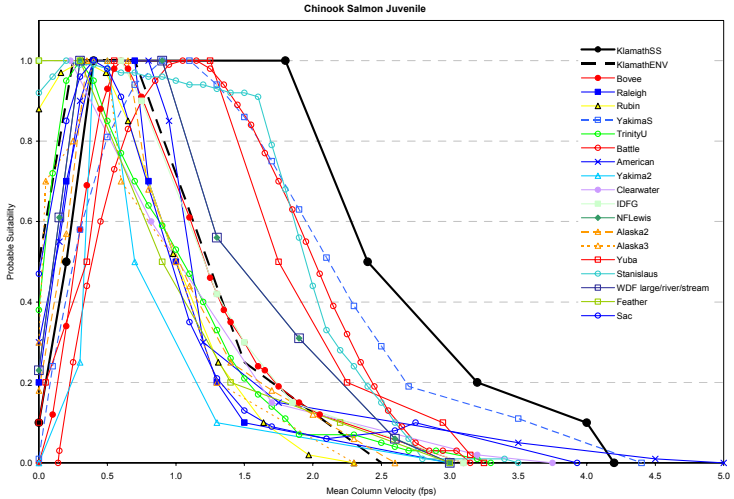


HSC Development History

Spring-run Chinook

- Use HSC from USFWS for spawning
- Review literature for fry and juvenile criteria





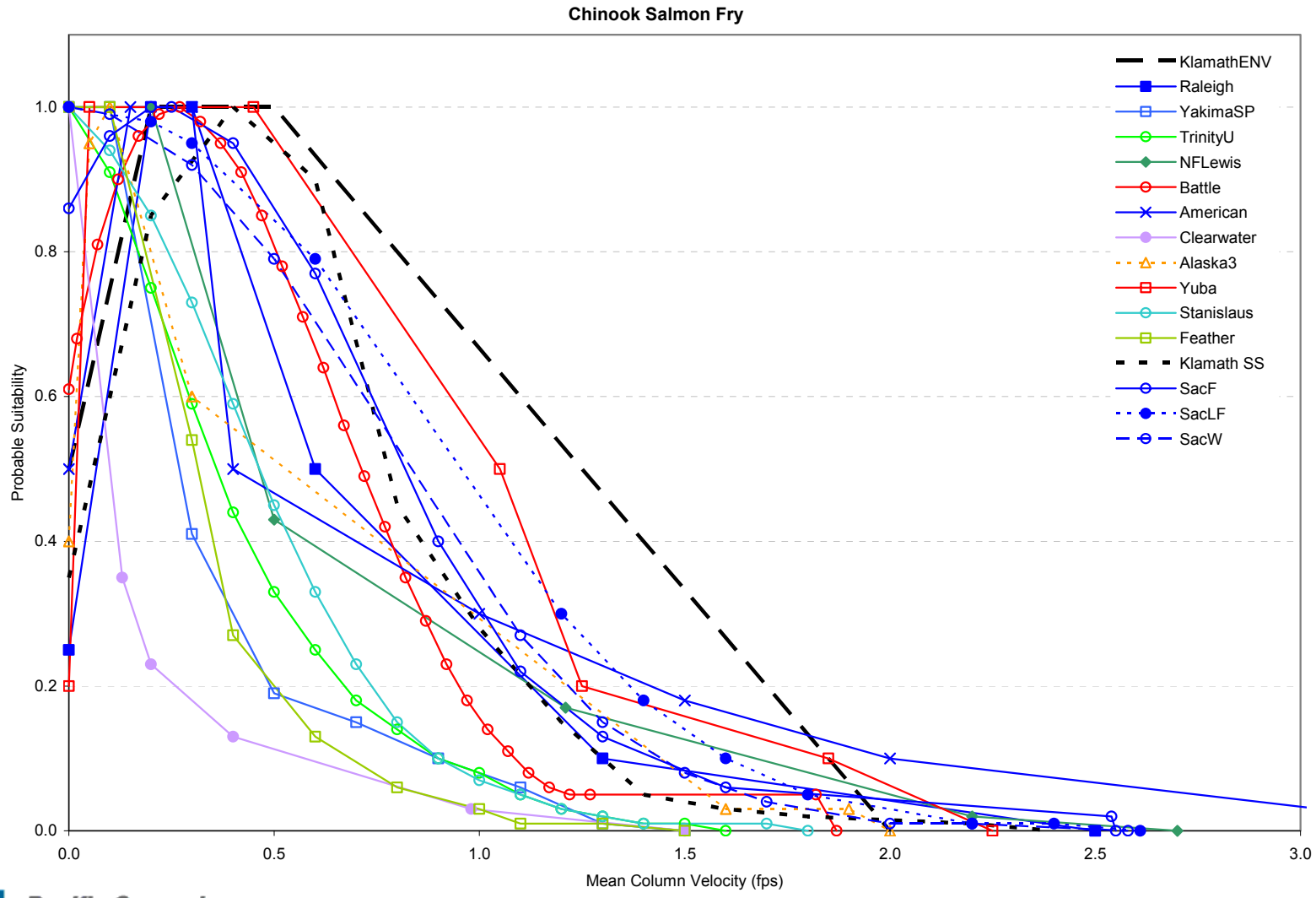
HSC Screening Criteria

- Maximize number of observations (>150 preferred)
- Identification of size classes
- Depth and velocity criteria
- Category II or III data
- Comparable stream size and morphology
- Availability data collected
- Data collection at high enough flows
- Presence/absence data

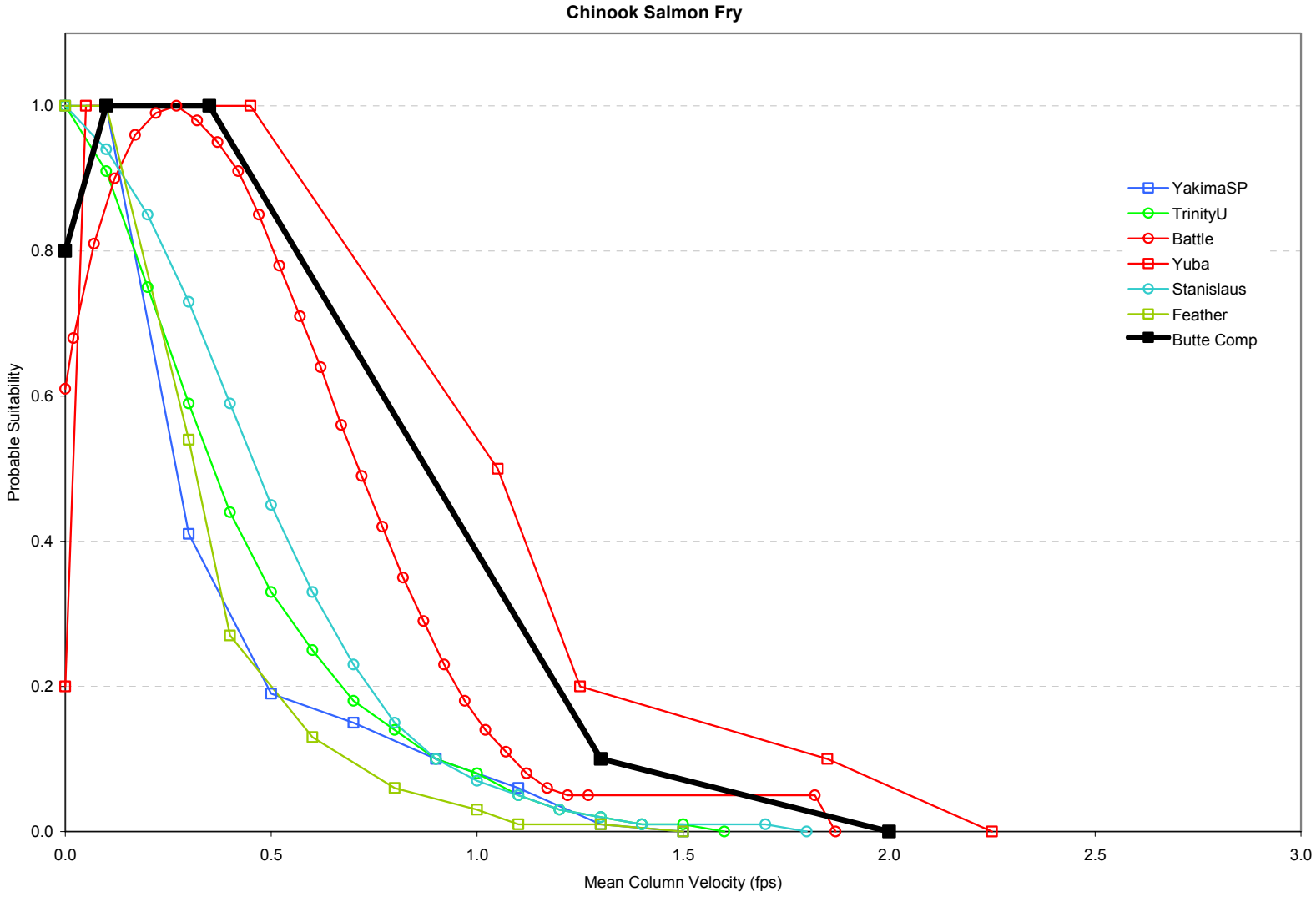
Chinook Fry

- 16 original HSC curves
- 3 eliminated that were Category I
- 1 eliminated for lack of depth criteria
- 2 eliminated for small sample sizes
- 4 eliminated for dissimilar river sizes
- Proposed curve drawn over dominant distribution pattern of remaining 6 curves

Chinook Fry Velocities: 16 curve set



Chinook Fry Velocities and Proposed Butte HSC



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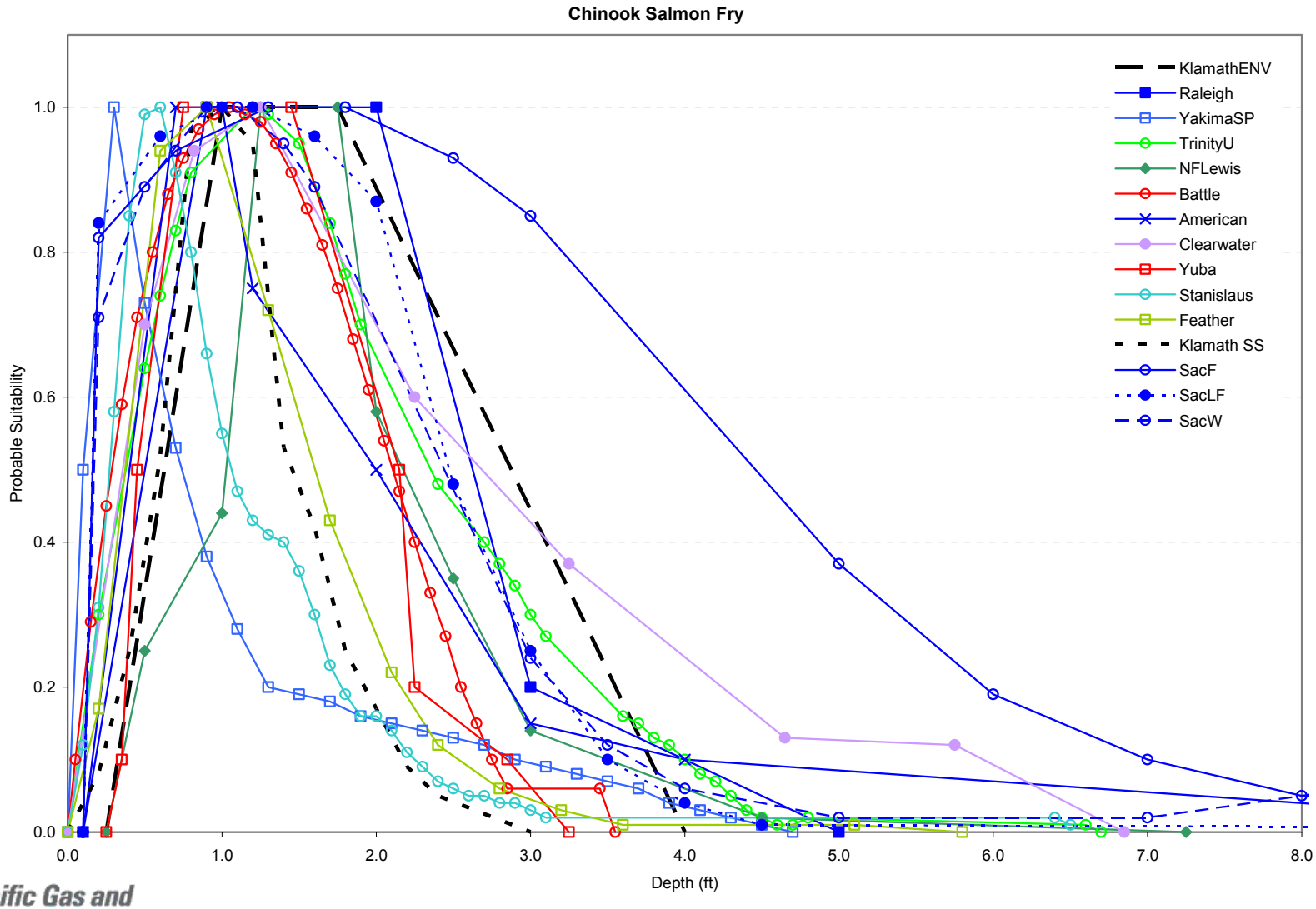
Chinook Fry Depths: 15 curve set



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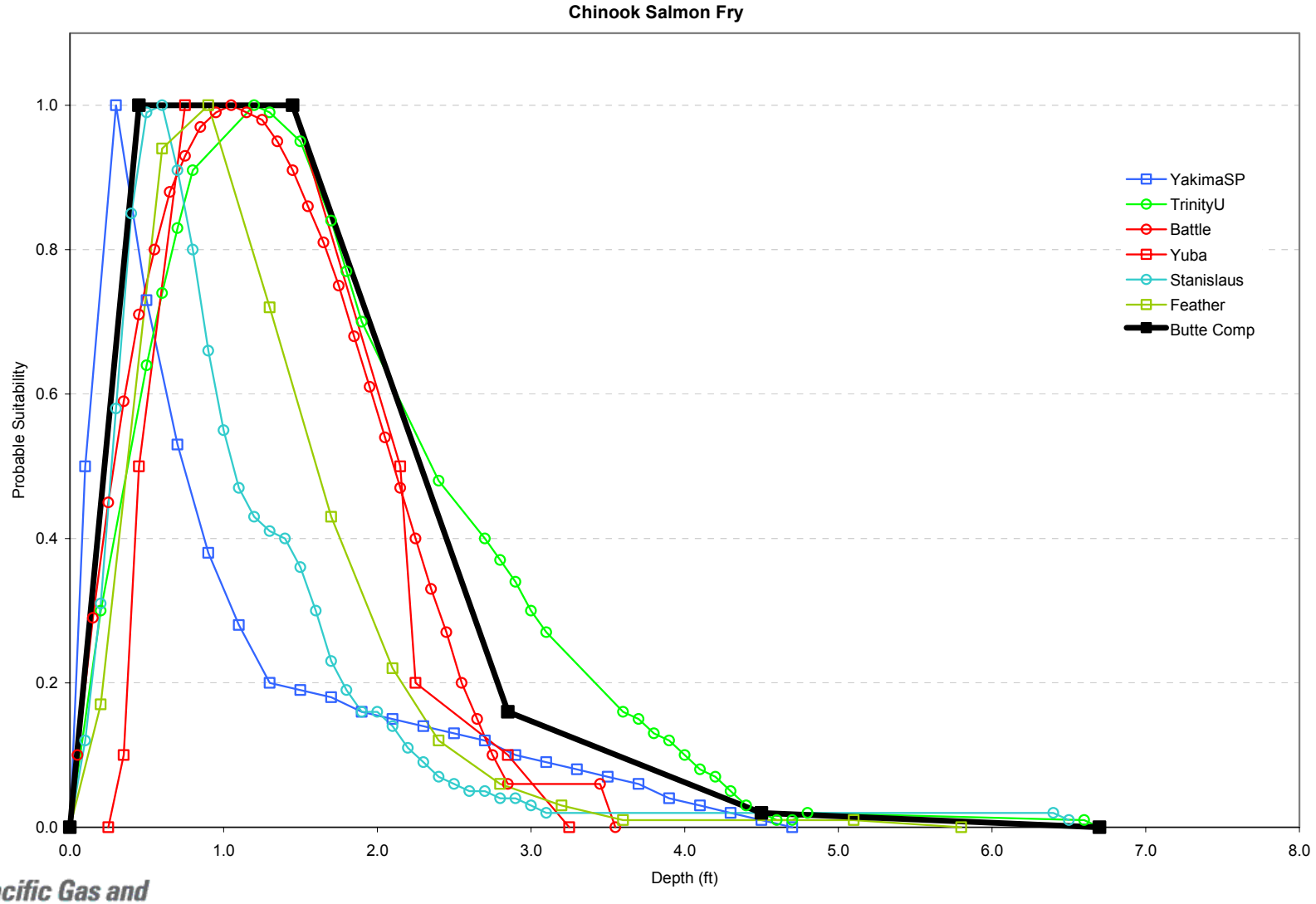
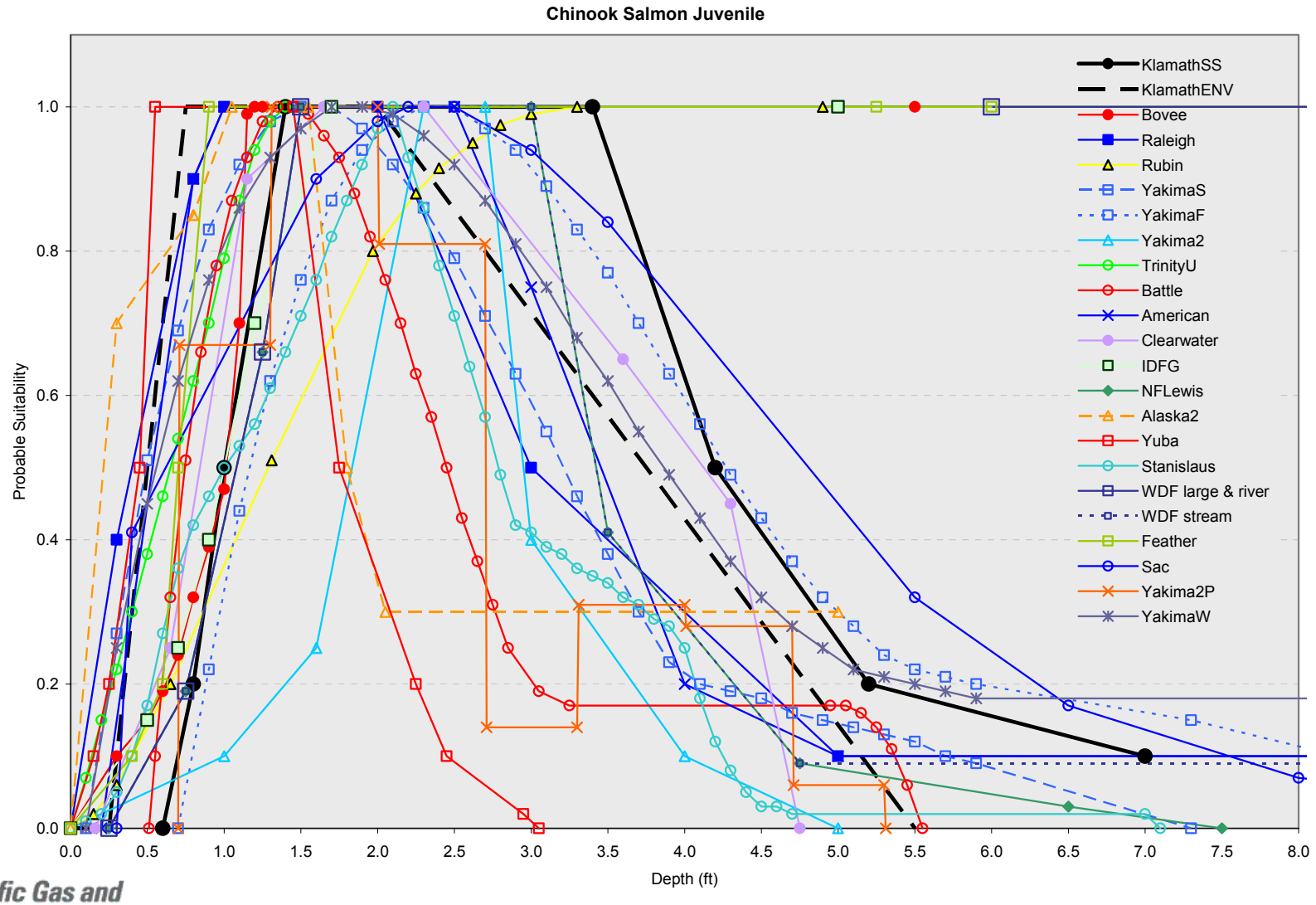
Chinook Fry Depths and Proposed Butte HSC



Chinook Juvenile

- 24 original HSC curves
- 6 eliminated that were Category I
- 1 eliminated for lack of depth criteria
- 3 eliminated for small sample sizes
- 2 eliminated for dissimilar river sizes
- 3 eliminated for lack of size class data
- Proposed curve drawn over dominant distribution pattern

Chinook Juvenile Depths: 23 curve set



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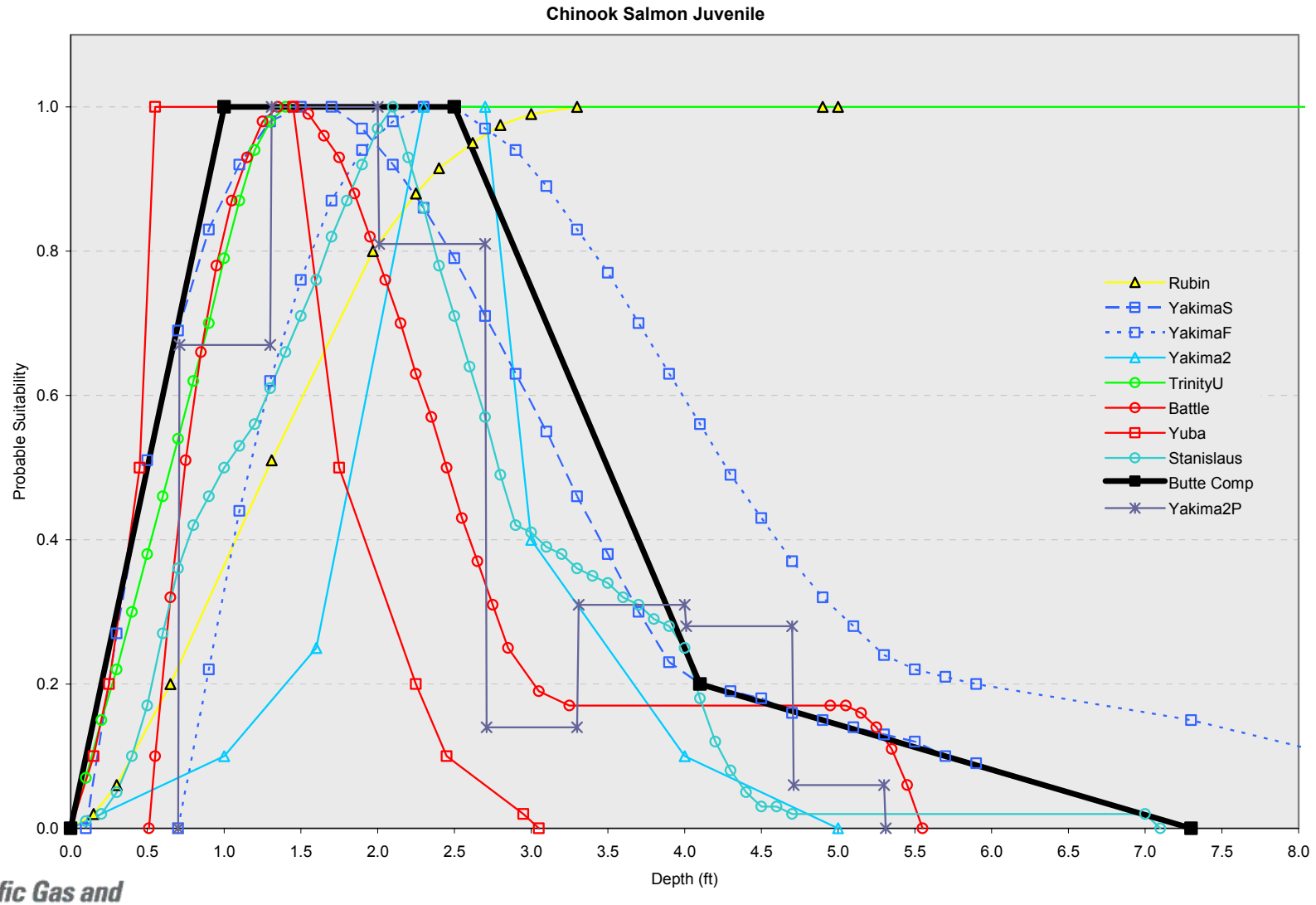
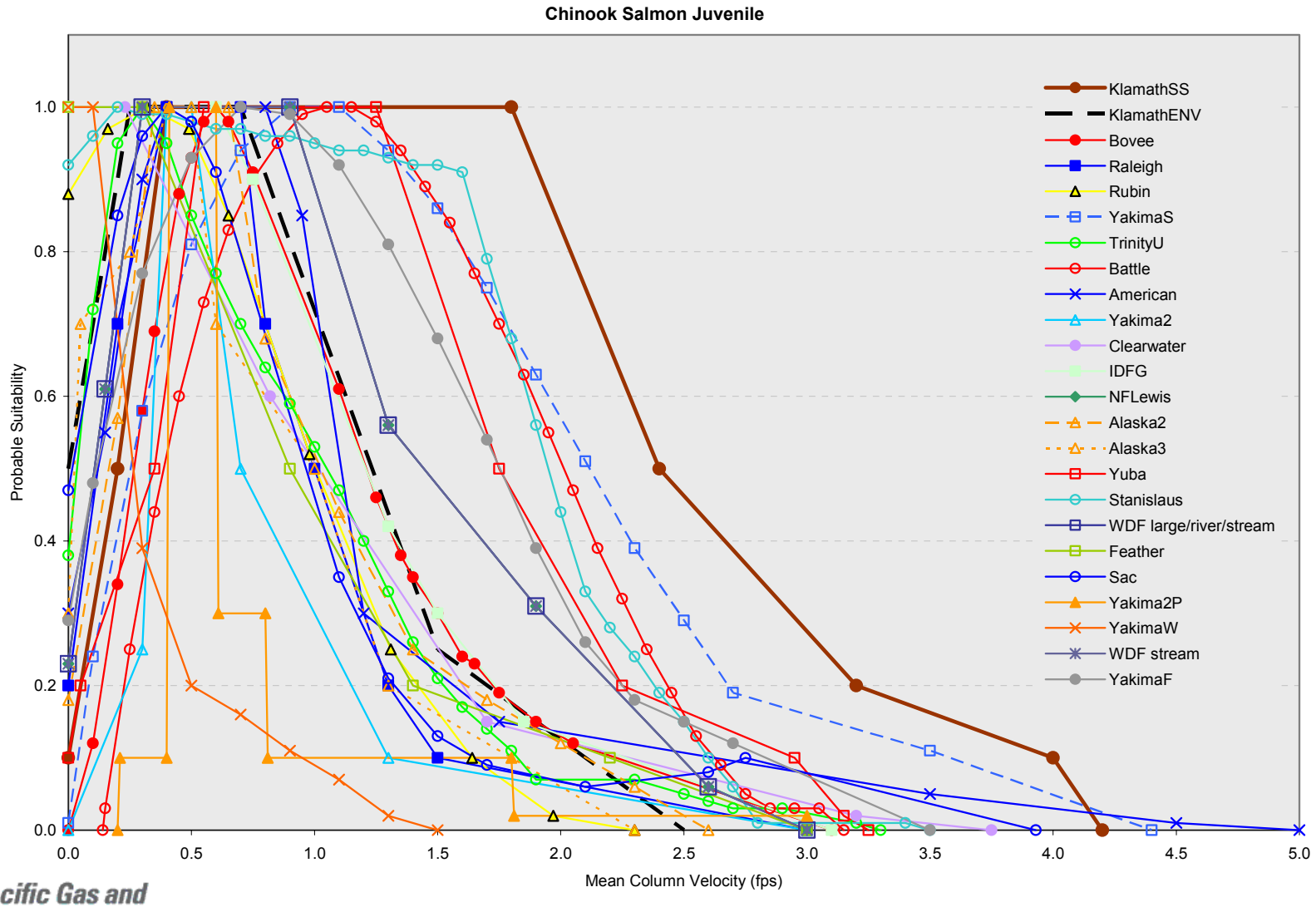
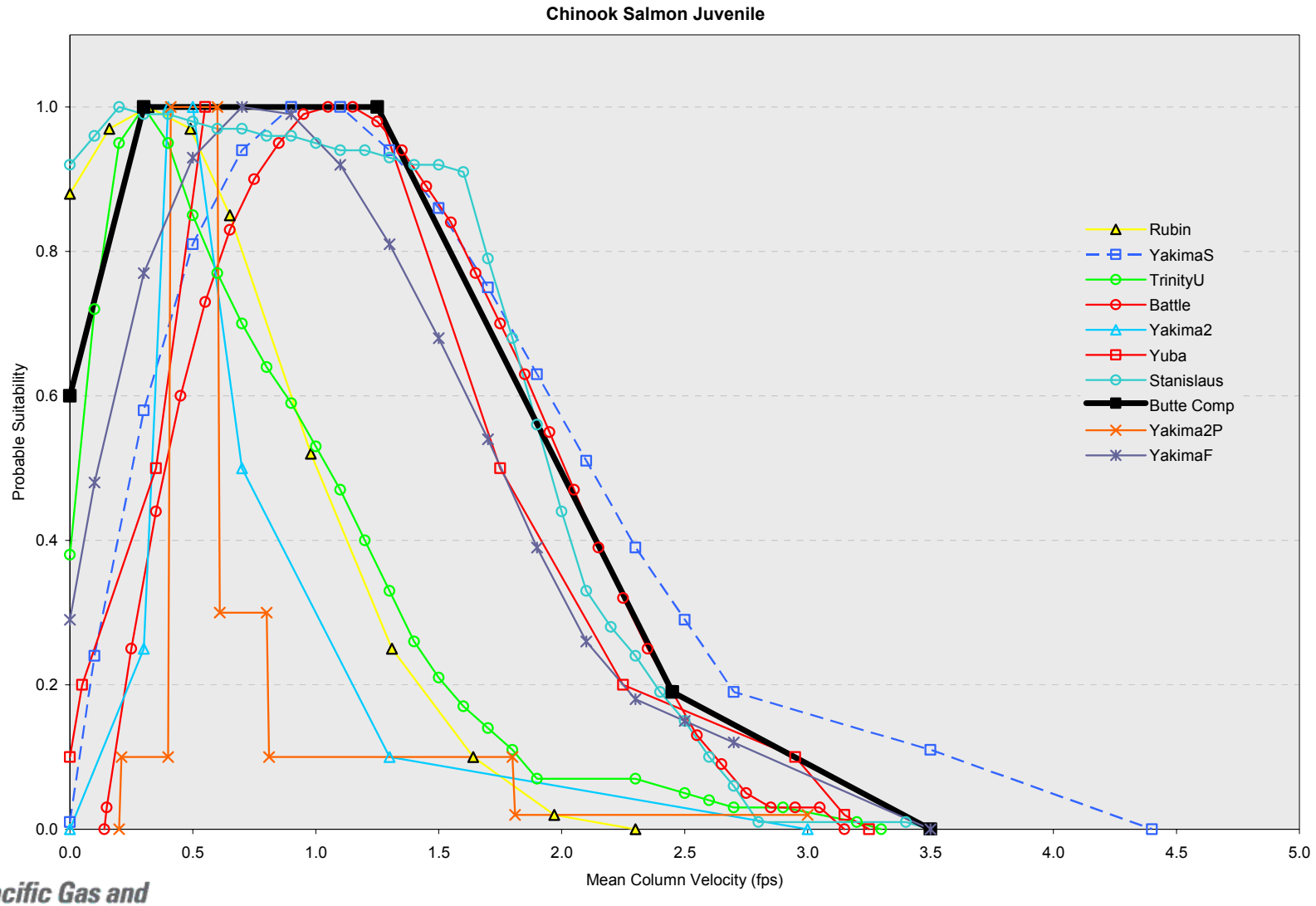
Chinook Juvenile Depths and Proposed Butte HSC



Chinook Juvenile Velocities: 24 curve set



Chinook Juvenile Velocities and Proposed Butte HSC



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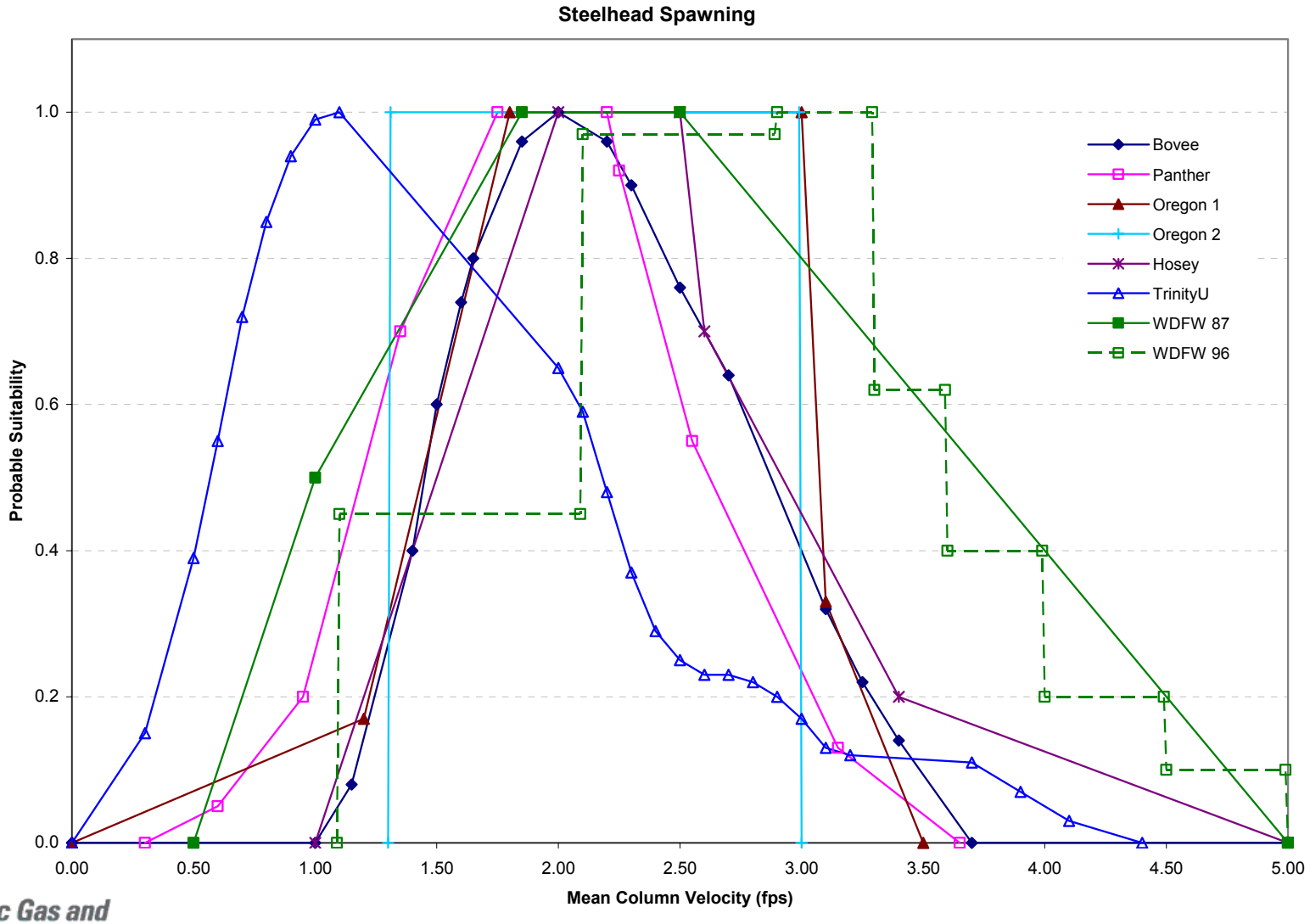
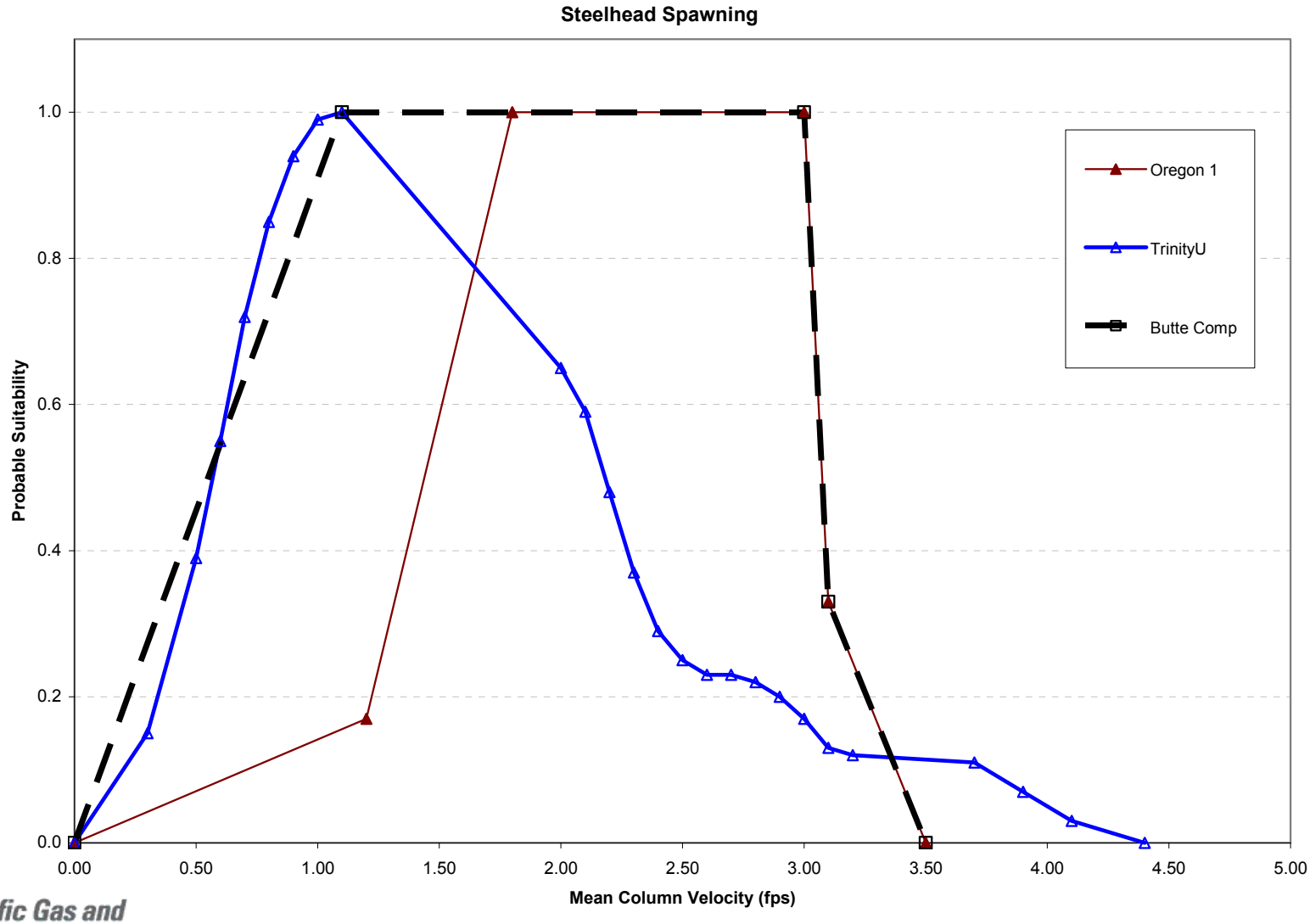
Steelhead Spawning

- 8 original HSC curves
- 5 eliminated that were Category I
- 1 eliminated as a Category 1 type composite
- 2 remaining curves have sample sizes <100
- Proposed curve drawn over dominant distribution pattern

Steelhead Spawning Velocities: 8 curve set



Steelhead Spawning Velocities and Proposed Butte HSC



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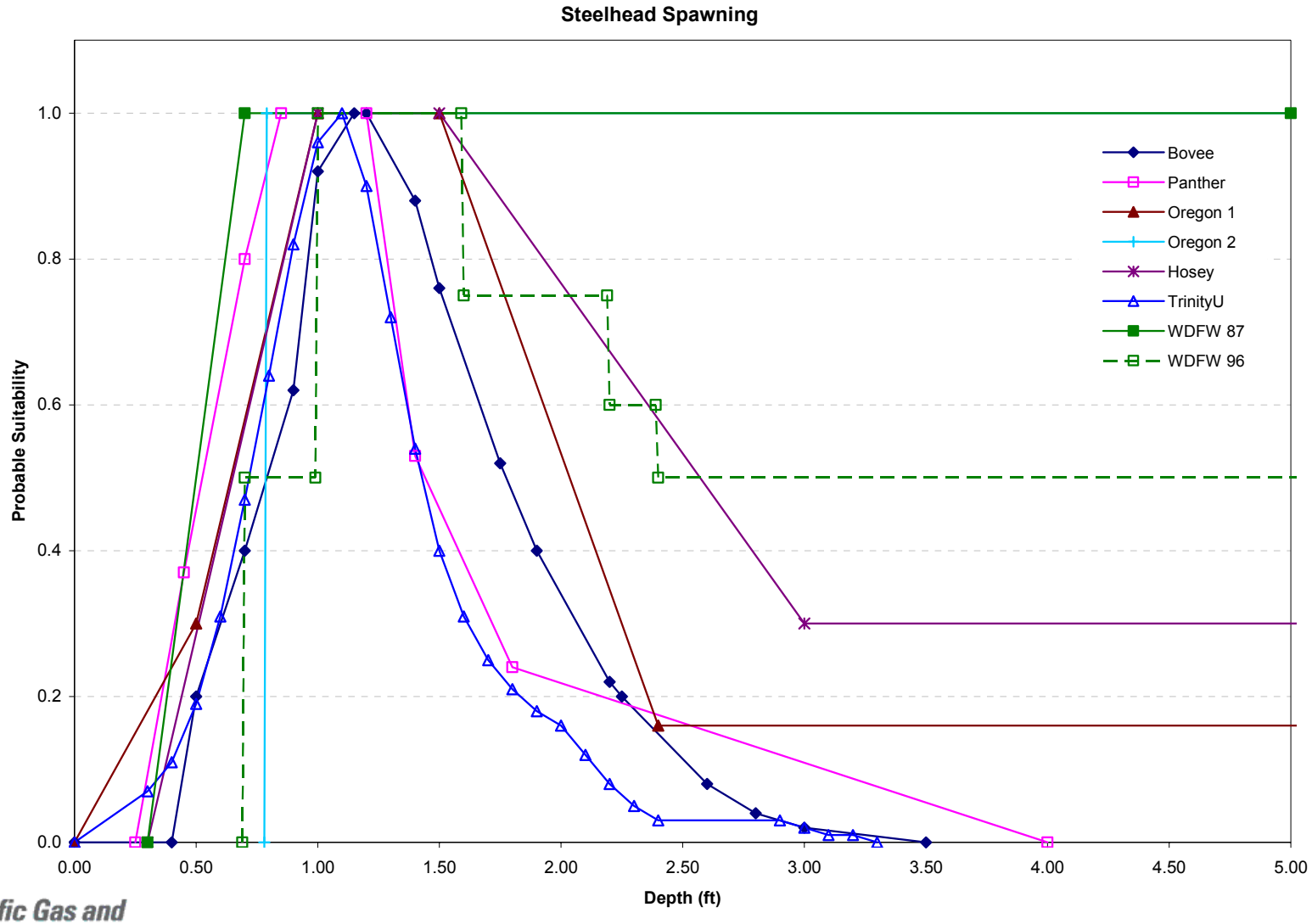
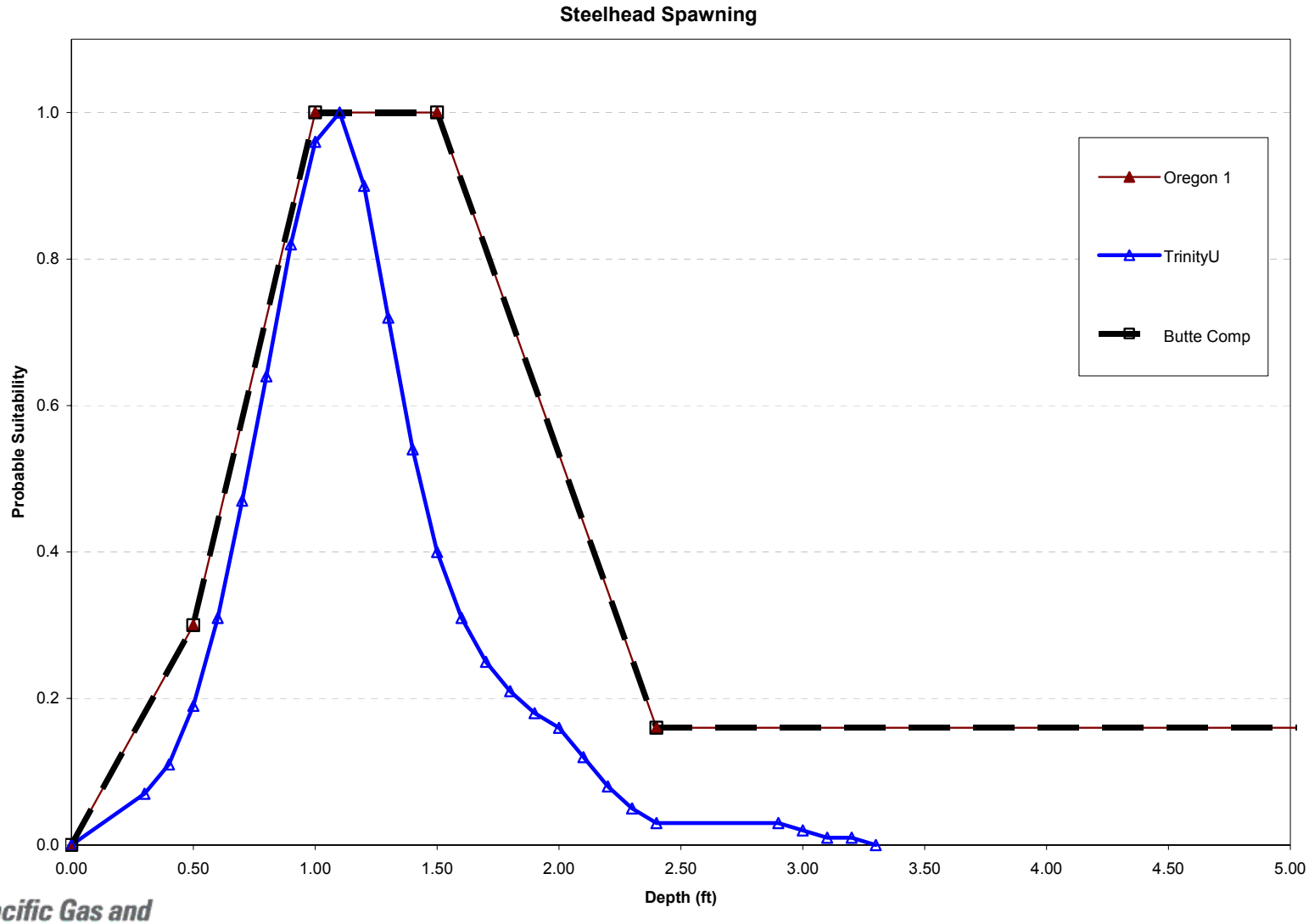
Steelhead Spawning Depths: 8 curve set



Steelhead Spawning Depths and Proposed Butte HSC



Steelhead Spawning Substrate

- 2 original HSC curves
- 1 rainbow curve
- Proposed curve drawn over dominant distribution pattern using professional judgement

Steelhead Spawning Substrates Proposed Butte HSC