2013 Long-Term Operations Biological Opinions Annual Science Review

NOAA FISHERIES
West Coast Region

Sacramento River Temperature Task Group
Summary of Fisheries

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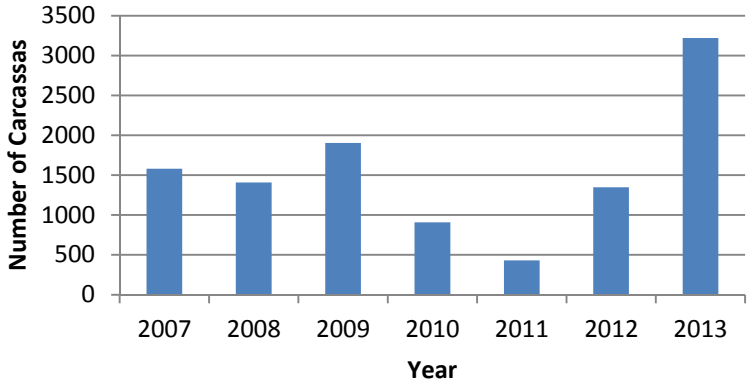
November 6, 2013

Outline

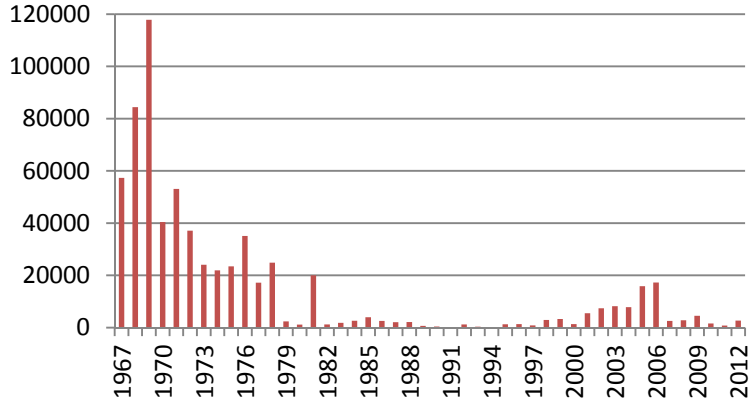
- Winter-run Chinook Salmon Monitoring
- Temperature Compliance Point and Winter-run Distribution
- 7-Day Average of Daily Maximum Water Temperature
- Redd Dewatering and Juvenile Stranding

WY 2013 Winter-run - Abundance

Winter-run Carcass Counts, 2007-2013

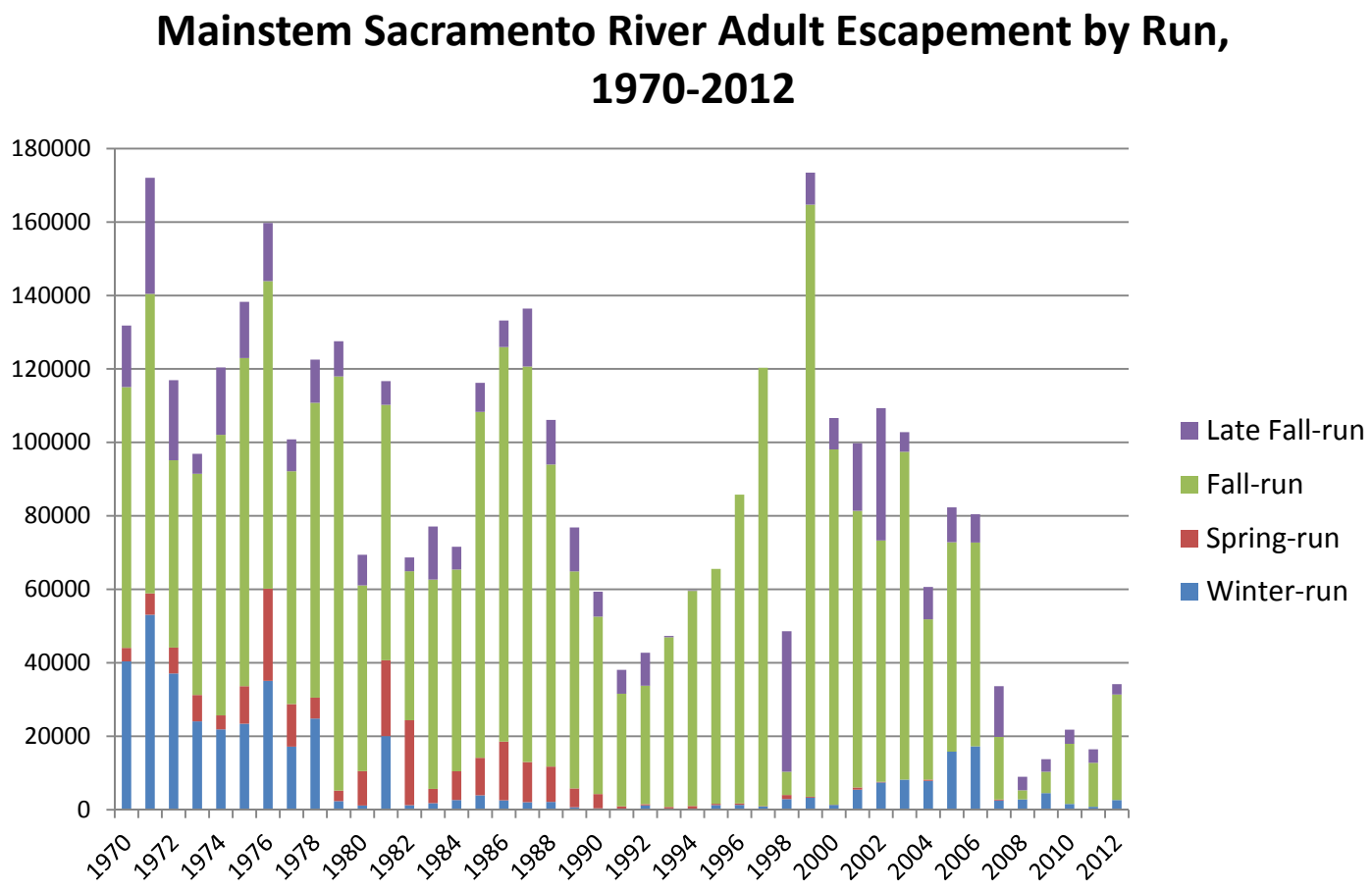


Winter-run Adult Escapement, 1967-2012



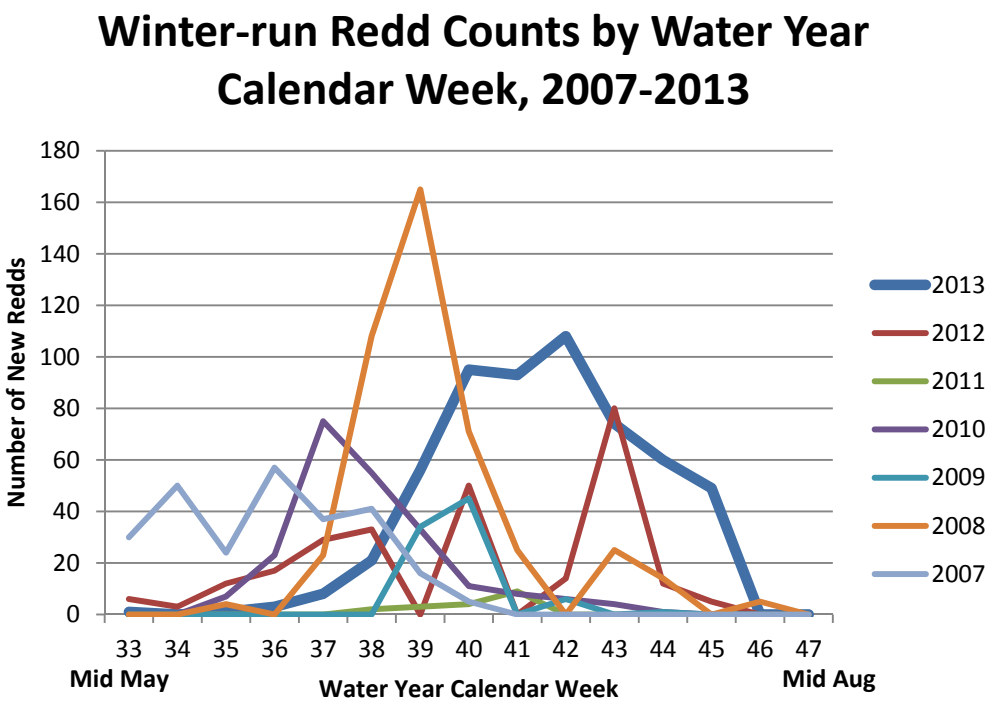
- 3220 carcasses (preliminary)
  - 155% increase over last 6 year average
- However, still very low abundance compared to historical returns

Mainstem Sacramento River Chinook Salmon Historical Abundance – All Runs

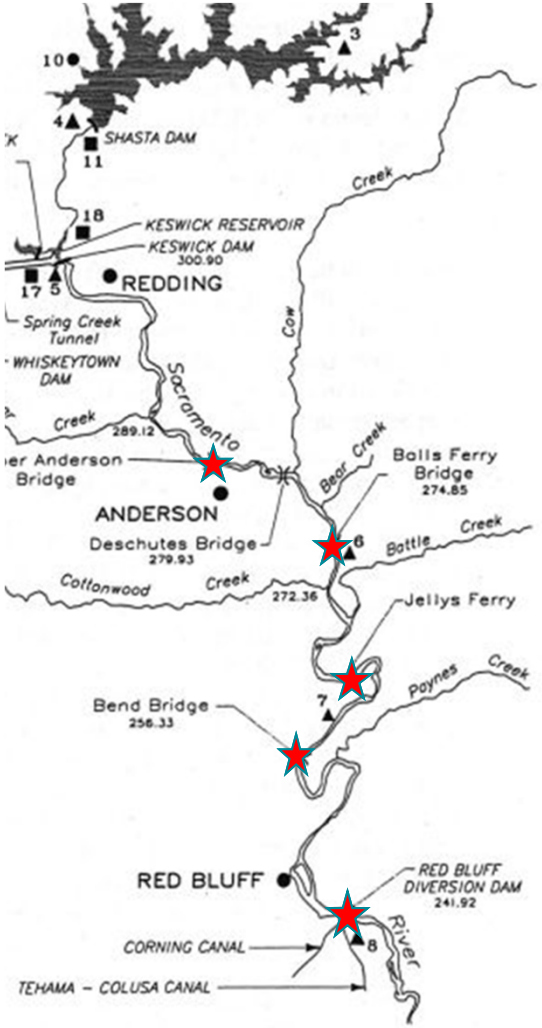


WY 2013 Winter-run – Timing and Distribution

- Timing
  - First redd identified in mid-May and last mid-August
  - Peak spawning was later than usual
- Distribution
  - First redd was the only one below Airport Road
  - Remaining 568 were above Airport Road



Sacramento River Temperature Compliance Points

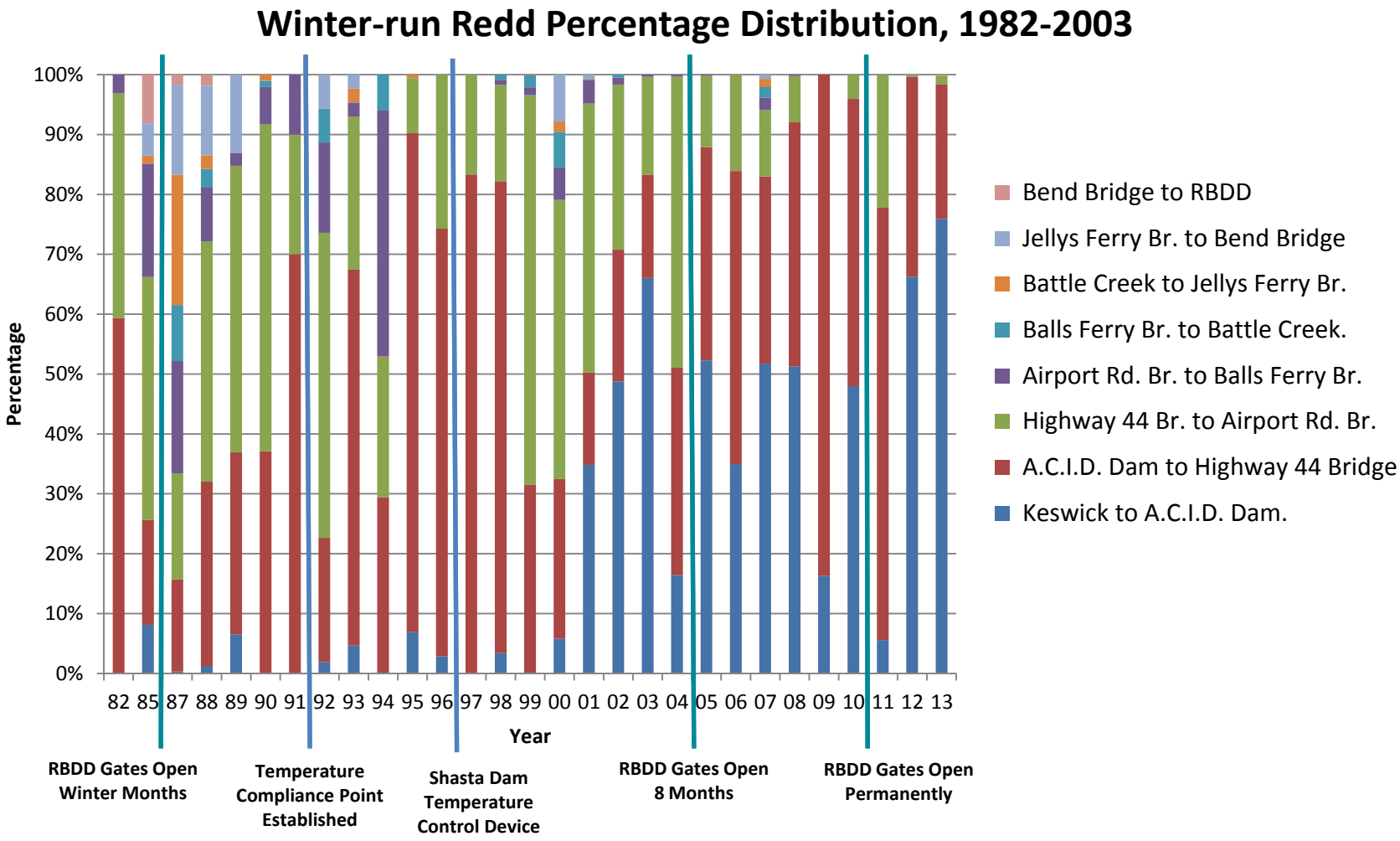


Temperature Compliance Points	River Miles Downstream of Keswick
Airport Road	18
Balls Ferry	25
Jellys Ferry	33
Bend Bridge	44
Red Bluff Diversion Dam	58

Winter-run - Distribution

- Spatial Structure = Greatest risk factor
- Water Rights Order 90-5 and 91-1 require Daily Avg Temp of 56^0F @ RBDD. However, there are exceptions:
  - Commitments to water contractors
  - D-1641 water quality criteria
  - Projected EOS storage
- TCP @ RBDD has never occurred

Winter-run Redd Historical Distribution

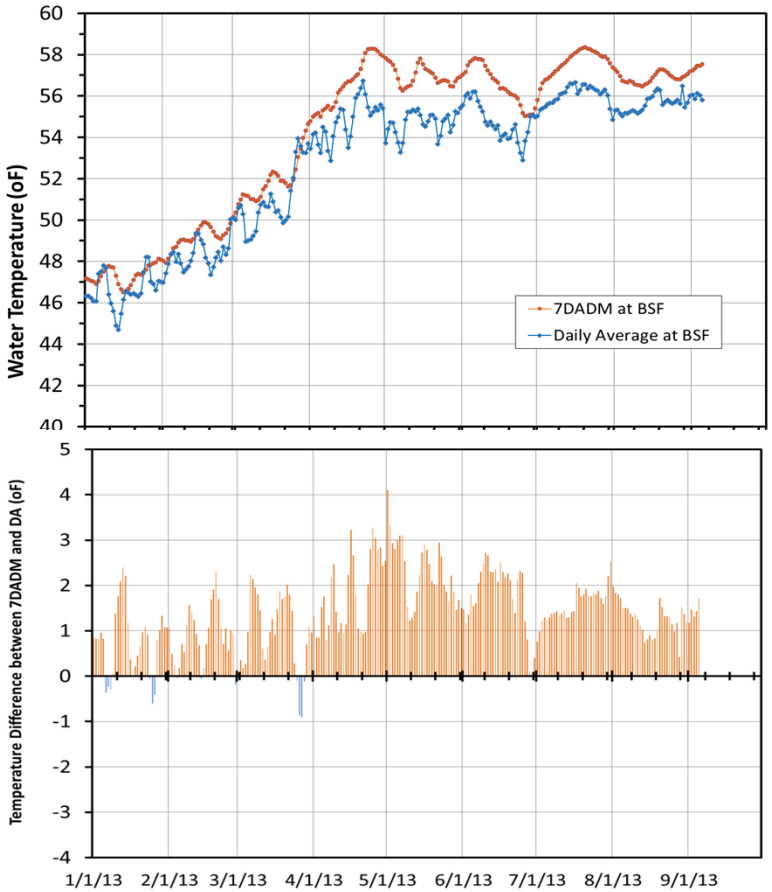


Water Temperature – 7 Day Average of Daily Maximum Water Temperature (7DADM)

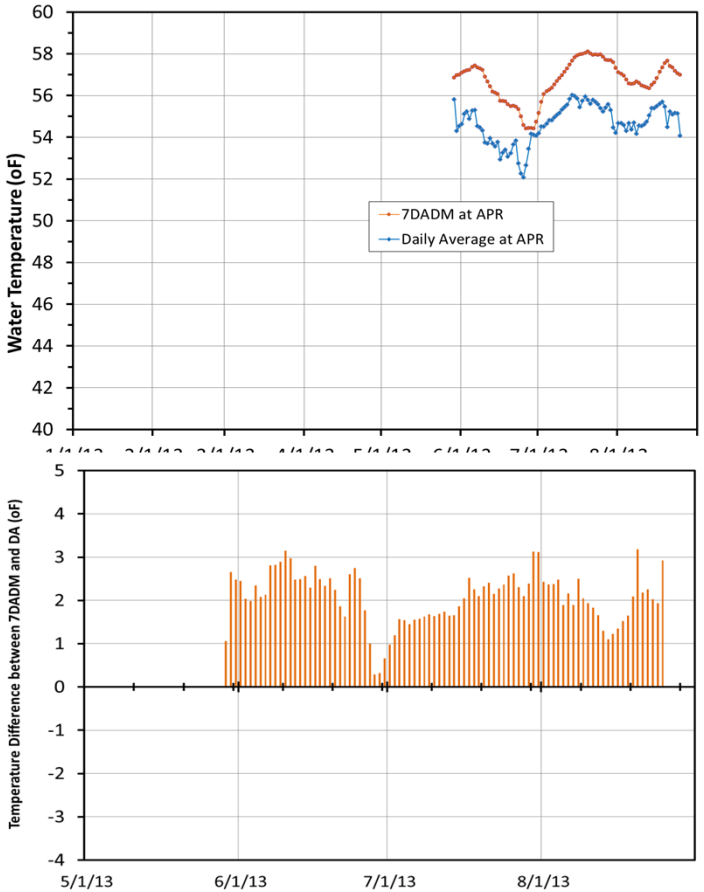
- Alternative metric to Daily Average Temperature to determine potential sub-lethal effects on life history stages
  - Individual effects: sub-optimal growth
  - Population effects: reduced size
- EPA Region 10 Guidance (2003)
  - Supported and endorsed by fish agencies
- Used in other Central Valley streams

7DADM Monitoring Results

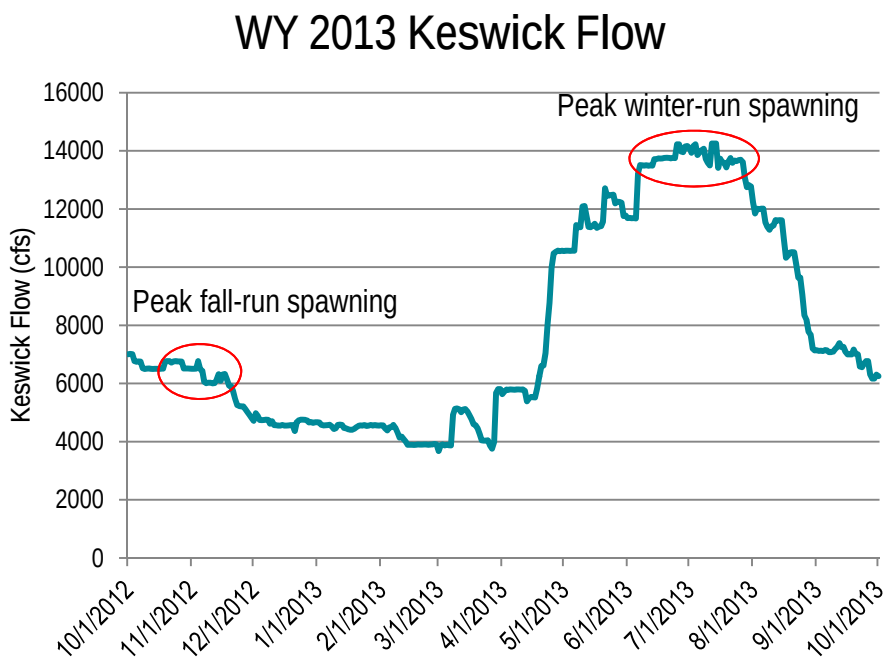
Balls Ferry



Airport Road



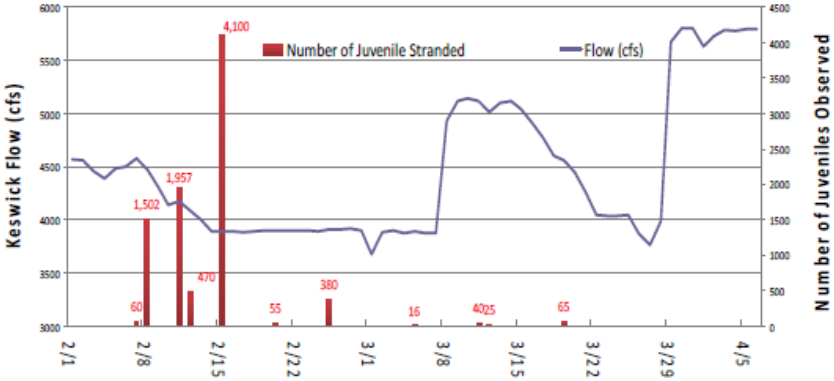
Redd Dewatering and Juvenile Stranding



- High flows during spawning season and are then "stepped-down" as season progresses
- RPA Action 1.2
- USFWS (2006) analysis of flow fluctuations and redd
- DWR and CDFW studies in WY2013

Redd Dewatering and Juvenile Stranding Results

- Fall-run Redds Dewatered
  - CDFW (Jan – Mar): 12 of 81
  - DWR (Oct – Mar): 123 of 348
- Juveniles Stranded
  - CDFW (Jan – Mar): 72 unique locations
  - 8,011 fall-run and 650 winter-run
- Winter-run Redds Dewatered
  - CDFW (Sept – Oct): 6 of 29



Questions for the Panel

1. What other tools are available to help forecast and manage storage and releases levels so we are not annually running into the issue of dewatering redds and stranding juveniles?
2. How does the Panel view using 7DADM as a measurement to consider potential sub-lethal effects on salmonid life history stages in lieu of daily average temperature?
   - If favorable, based on best available science, what would be a comparable 7DADM be to the current 56 degree daily average?