Initial Panel Findings/ Recommendations

LOBO 2014

Hydrologic Water Year Review:

- Opportunity for analysis and refinement of landscape-level climate patterns that might affect management strategies.
    - A time-series analysis of historical records [carefully chosen] allows the "gaming" of flow reductions of 20%, 30%, or 40% flow reductions – [including reservoirs]
    - Will create some very different estimates of long-term water availability – e.g., end of year storage as a target for in-season mgmt

April 1 Snow Water Equivalents San Joaquin, Sacramento, Trinity

Elevation	2005-2034	2035-2064	2070-2099
1000-2000m	-13 to -48 %	-26 to -68 %	-60 to -93%
2000-3000m	+12 to -33 %	-08 to -36 %	-25 to -79 %
3000-4000m	+19 to -13 %	-02 to -16 %	-02 to -55 %
All Elevations	+06 to -29 %	+.12 to -42 %	-32 to -79 %

Reductions in Climatic Oscillations

* AMO, PDO, ENSO dampened by increasing oceanic temperatures
* Are we “stuck” in current climatic pattern
* WHAT IF THIS IS THE NEW “NORMAL”?

GENERAL OBSERVATIONS

GENERAL OBSERVATION:

- Continue anticipatory research/decisions rather than reactive (crisis management) actions

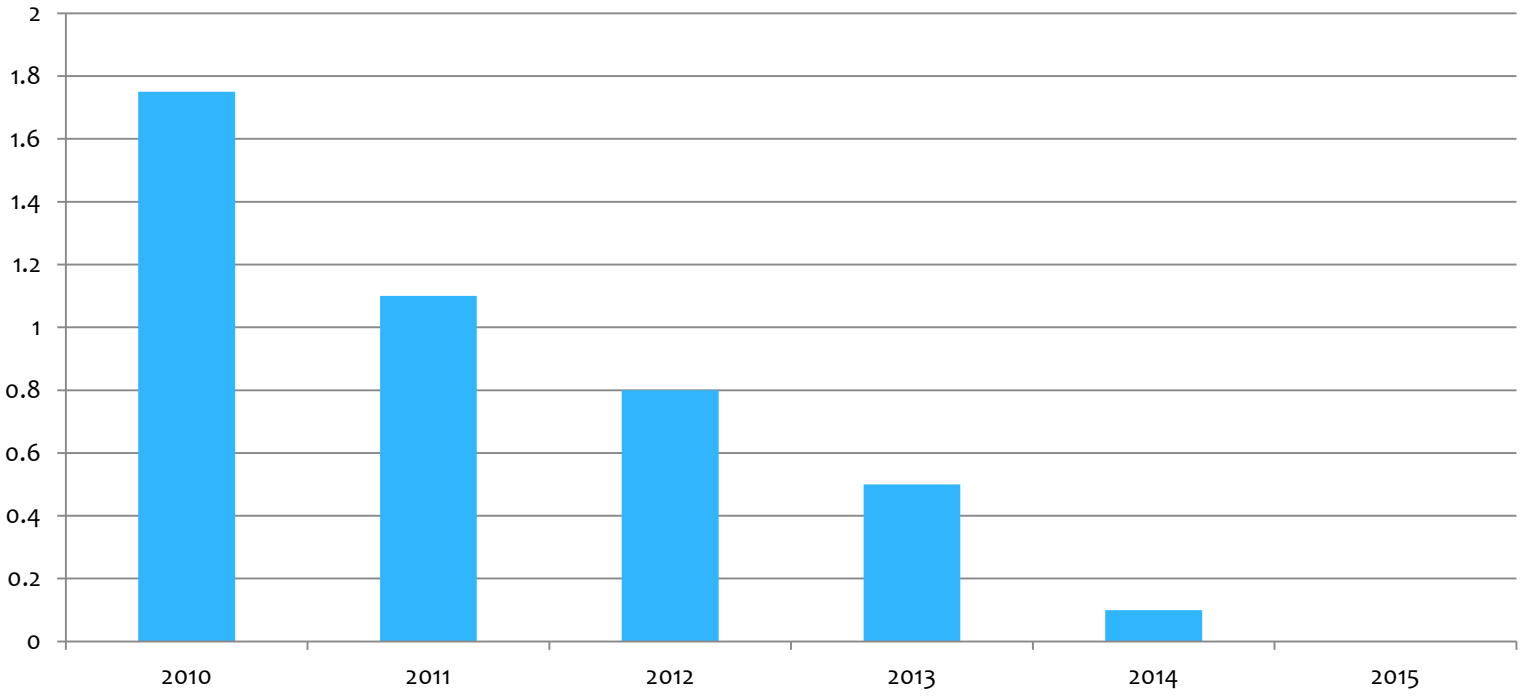
- Drought conditions might mean that reconsideration of rule curve is necessary under extreme drought conditions

- "Water temperature was tracking 4° higher than the predictive model." How many river miles or water allocation is that?

GENERAL OBSERVATION:

- If in a continuing drought, consider end-of-year storage target from year-to-year for in-season management

- Continue to connect hydrologic conditions to fish survival . Assess adequacy of current models.


2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2010
2011
2012
2013
2014
2015

GENERAL OBSERVATION:

- If in a continuing drought, consider end-of-year storage target from year-to-year for in-season management

- Continue to connect hydrologic conditions to fish survival . Assess adequacy of current models.

Modified Delta Cross Channel Gate Opening Criteria

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* Model the value of diurnal release
  - What water quality stations to be used?
  - Transit time versus benefit
  - Is net benefit worth the risk of opening gates?
  - What opportunities are available if gates are replaced/rebuilt?
  - For example, DCC not under jurisdiction of boats and waterways during drought

Modified Delta Cross Channel Gate Opening Criteria

* Model the value of diurnal release
  - benefit to fish protection vs. water quality protection is unclear [assessment of triggers]
  - need a "net" immediately downstream of gate to assess value of upstream actions
  - Continue monitoring of Georgiana Slough with the same sort of "net"

Modifications to the Winter-Run Chinook Salmon Juvenile Production Estimate (JPE) and Use/Application of Survival from Acoustically Tagged Chinook Salmon Releases

Modified Delta Cross Channel Gate Opening Criteria

- Plum paper needs to undergo peer-review before conclusions are adopted
- Expand mission horizon from ESA purposes only to multi-objective purposes of system management
  - Critical to link fish survival and operations under drought conditions = better in-season decisions

Modifications to the Winter-Run Chinook Salmon Juvenile Production Estimate (JPE)

- Explore the potential of other methods to estimate JPE survival values from acoustic tags
- What drives the index from year-to-year? Appears to be escapement
- Annual adjustments to values confound uncertainty of the prediction – needs to be propagated through the spreadsheet model as a final product and to guide future adjustments
- Temperature-exposure model(s) needs to more accurately reflect temperature exposure of redds

Modifications to the Winter-Run Chinook Salmon Juvenile Production Estimate (JPE)

- What are the dimensions of the system under drought conditions? Re: predation, stranding, physiological stress [values have greater effect]

- Reliability of acoustic tags? Continue to use coded wire tags for comparison. Multiple hydrophones in system to improve reading of acoustic tags.

- True survival, then, is probably higher. Probability of detection varies with flow events.

Modifications to the Winter-Run Chinook Salmon Juvenile Production Estimate (JPE)

- Fish held in the upper part of the system – need to add additional mortality factor

- Multiple releases (smaller batches) over time provides more survival information – records of temperature, flow, etc. measured simultaneously – identify reach-specific mortality

Proposal Calculating Cumulative Salvage Index Values for Estimating Take

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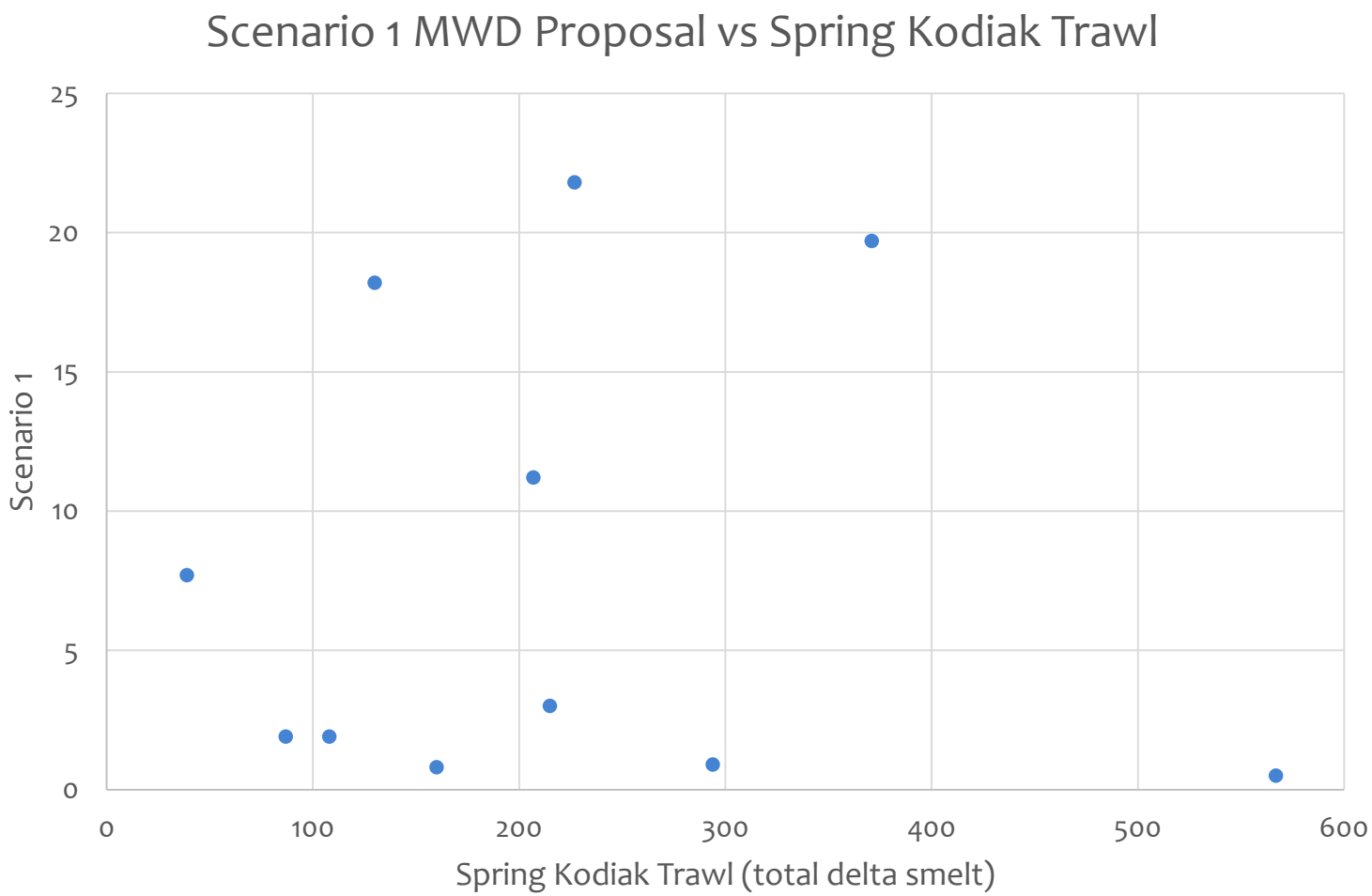
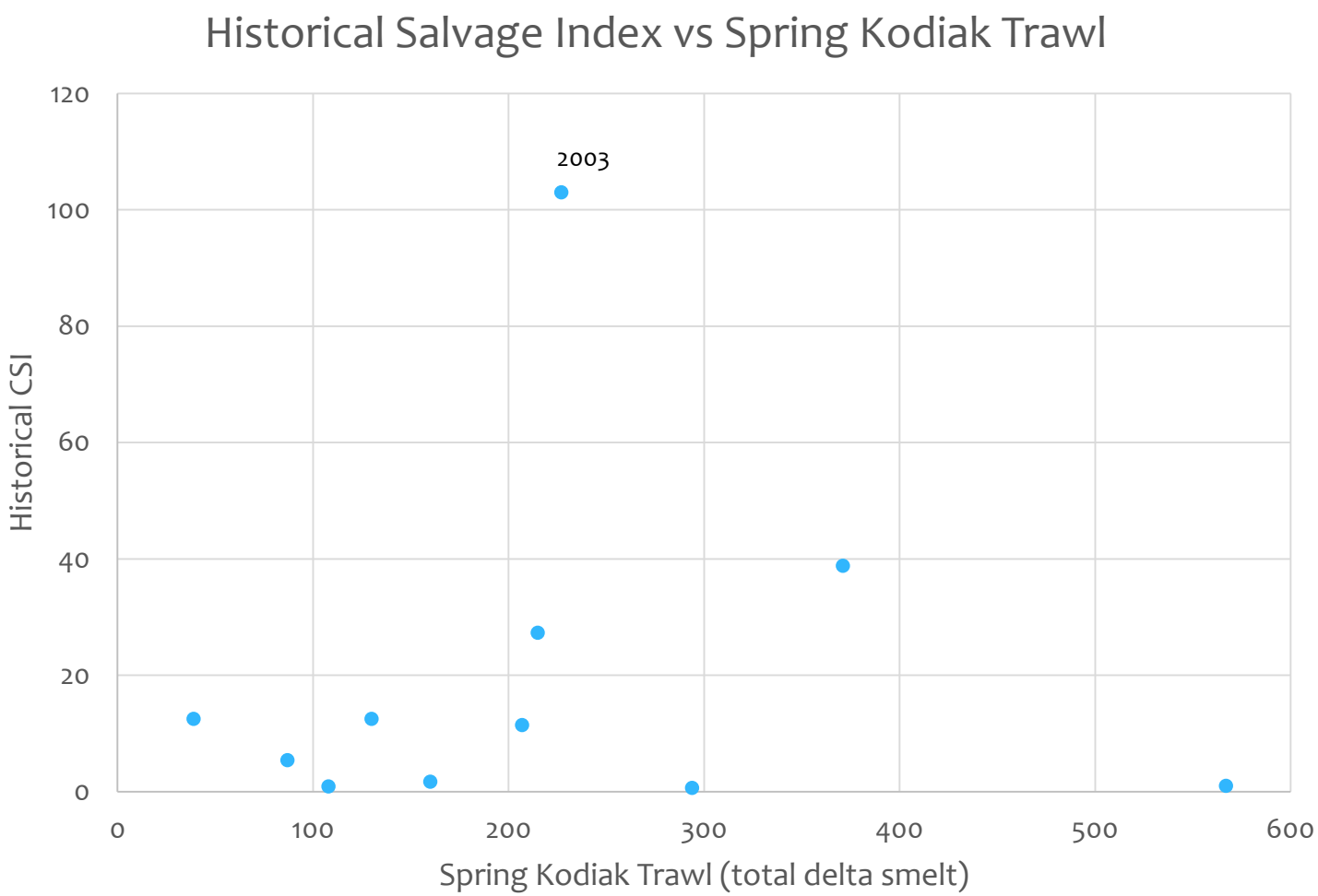
* Appears to be no relationship between two trawl types
  * Fall mid-water trawl not designed for Delta smelt abundance measures
  * Spring Kodiak trawl IS designed for Delta smelt
  * Problem: no good relationship between CSI and population size


Scenario 1 MWD Proposal vs Spring Kodiak Trawl
Scenario 1
25
20
15
10
5
0
0
100
200
300
400
500
600
Spring Kodiak Trawl (total delta smelt)


Historical Salvage Index vs Spring Kodiak Trawl
2003
Historical CSI
120
100
80
60
40
20
0
0
100
200
300
400
500
600
Spring Kodiak Trawl (total delta smelt)

Proposal Calculating Cumulative Salvage Index Values for Estimating Take

* Proposed model does not appear to be an improvement on the old model either statistically or for protecting smelt

* $\gamma = e^{a * OMR + b * Secchi}$

* "FMWT (t-1)" not useful

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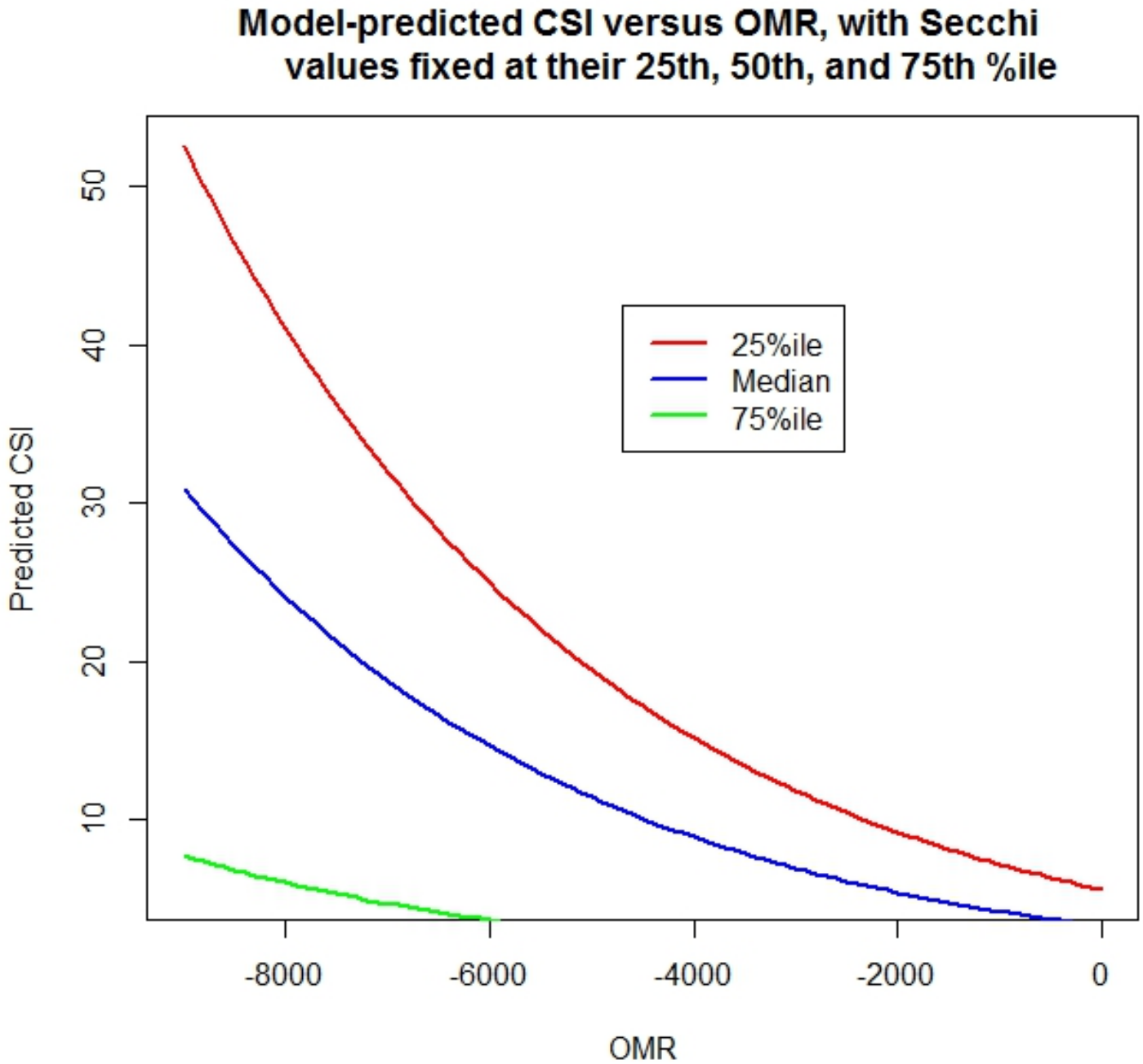
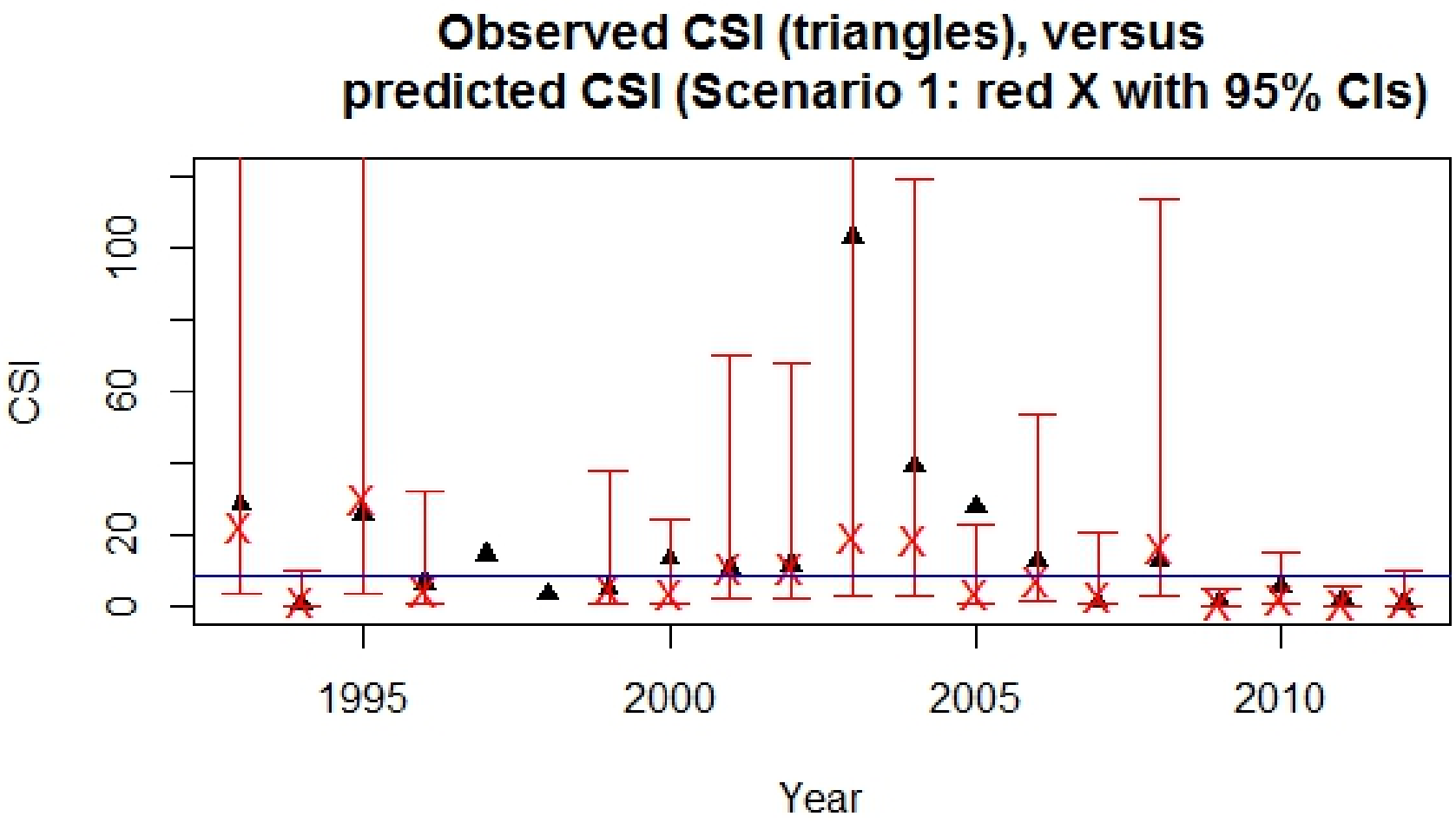

Model-predicted CSI versus OMR, with Secchi values fixed at their 25th, 50th, and 75th %ile
Predicted CSI
10
20
30
40
50
-8000
-6000
-4000
-2000
0
OMR
25%ile
Median
75%ile


Observed CSI (triangles), versus
predicted CSI (Scenario 1: red X with 95% CIs)
CSI
0
20
60
100
1995
2000
2005
2010
Year

Proposal Calculating Cumulative Salvage Index Values for Estimating Take

* Regression model does not appear to offer a more reliable salvage index
* Flow and turbidity must be factored in but this is not the proper method – get more mechanistic / spatially explicit modeling
* Need a more reliable take estimate

QUESTIONS?

SCHEDULE

* Finish drafting and send lead author (15 Nov)
* Lead author incorporates comments and sends first draft to panel (21 Nov)
* Panel sends comments back to Lead Author (25 Nov)
* Teleconference? (27 Nov)
* Lead Author revises, and sends second draft (30 Nov)
* Panel sends final comments back to Lead Author (5 Dec)
* Final Panel report sent to Delta Science Program (7 Dec)