



Issue 5

Delta Outflow Objective

X2 Estuarine Habitat Objective (February-June)

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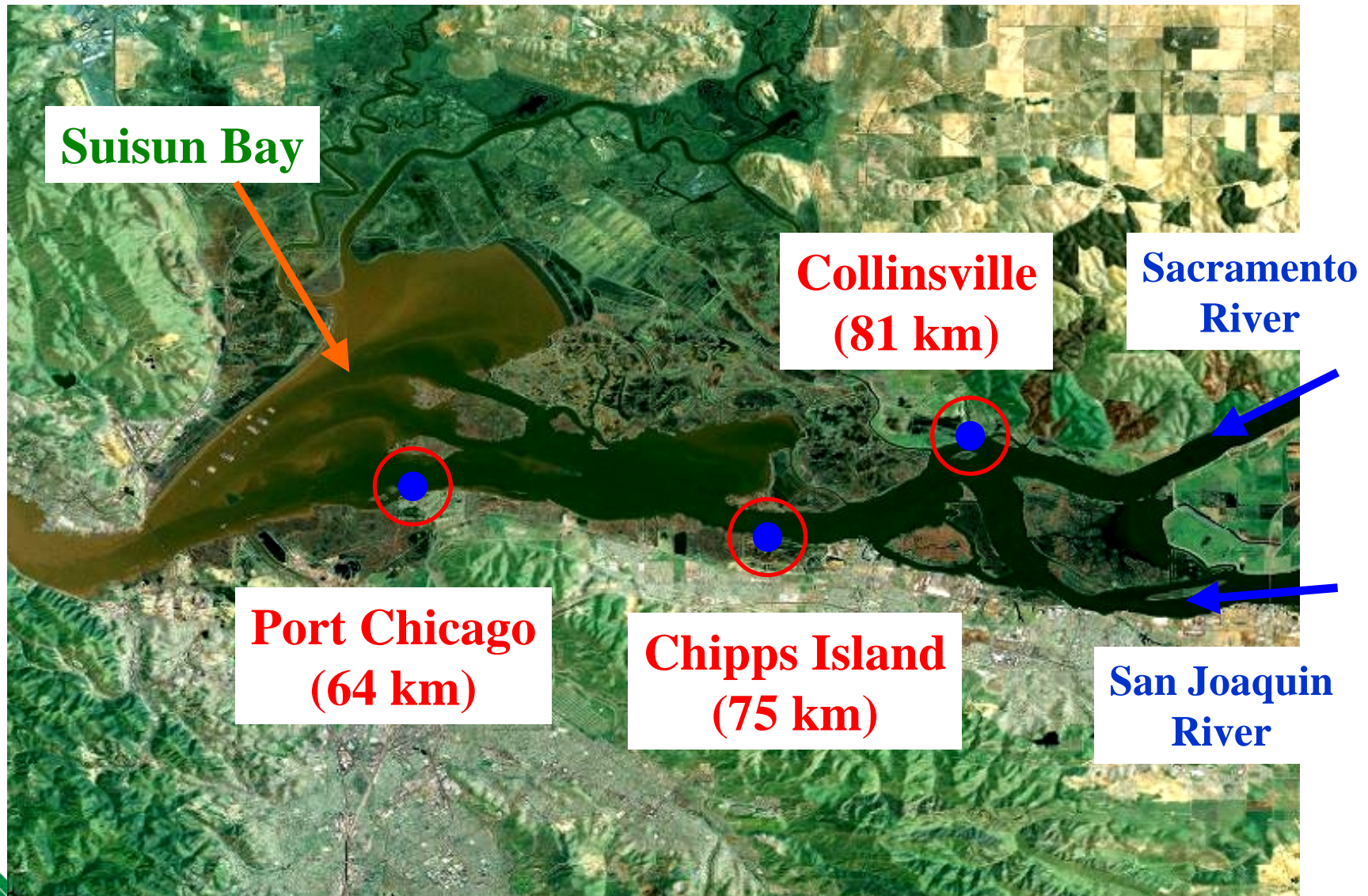




X2 Provides Some Drinking Water Protection in the Spring

In the absence of a genuine drinking water objective, the February-June X2 fish protection objective provides protection of drinking water beneficial uses that must be maintained

Location of X2 Stations in Suisun Bay





X2 is Distance from Golden Gate

- X2 is the distance in kilometers from the Golden Gate Bridge of the 2 parts per thousand (ppt) bottom salinity
 - ❖ 2 ppt salinity is approximately 2 mg/L total dissolved solids
 - ❖ 1995 Plan objective met as an equivalent surface electrical conductivity of 2.64 mmhos/cm, or equivalent Delta outflow
- 1995 Plan allows three ways to comply with X2 Objective:
 - ❖ Daily EC of 2.64 mmhos/cm; or,
 - ❖ 14-day EC of 2.64 mmhos/cm; or,
 - ❖ 3-day Net Delta Outflow Index value



Requirements for X2 Objective

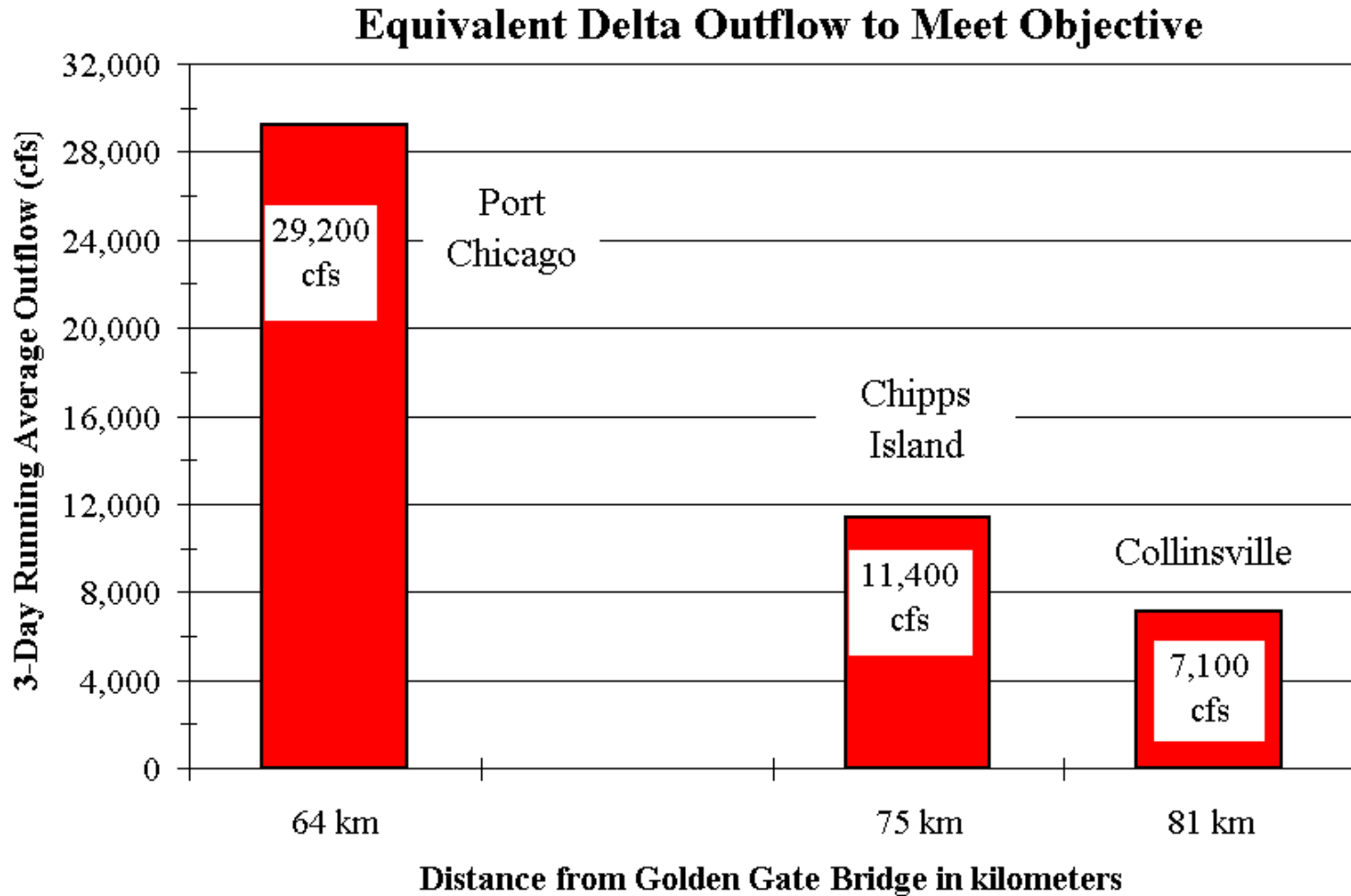
- X2 only applies in the Spring (February-June)
- X2 objective for Port Chicago is only required (triggered) when 14-day EC at the end of the previous month is 2.64 mmhos/cm or less
- Number of days that X2 has to be met at each location is determined from previous month's runoff index
- Intent of X2 objective was to provide good habitat conditions for fish (lower salinities) in Suisun Bay
 - ❖ Also protects drinking water quality



X2 Objective Locations

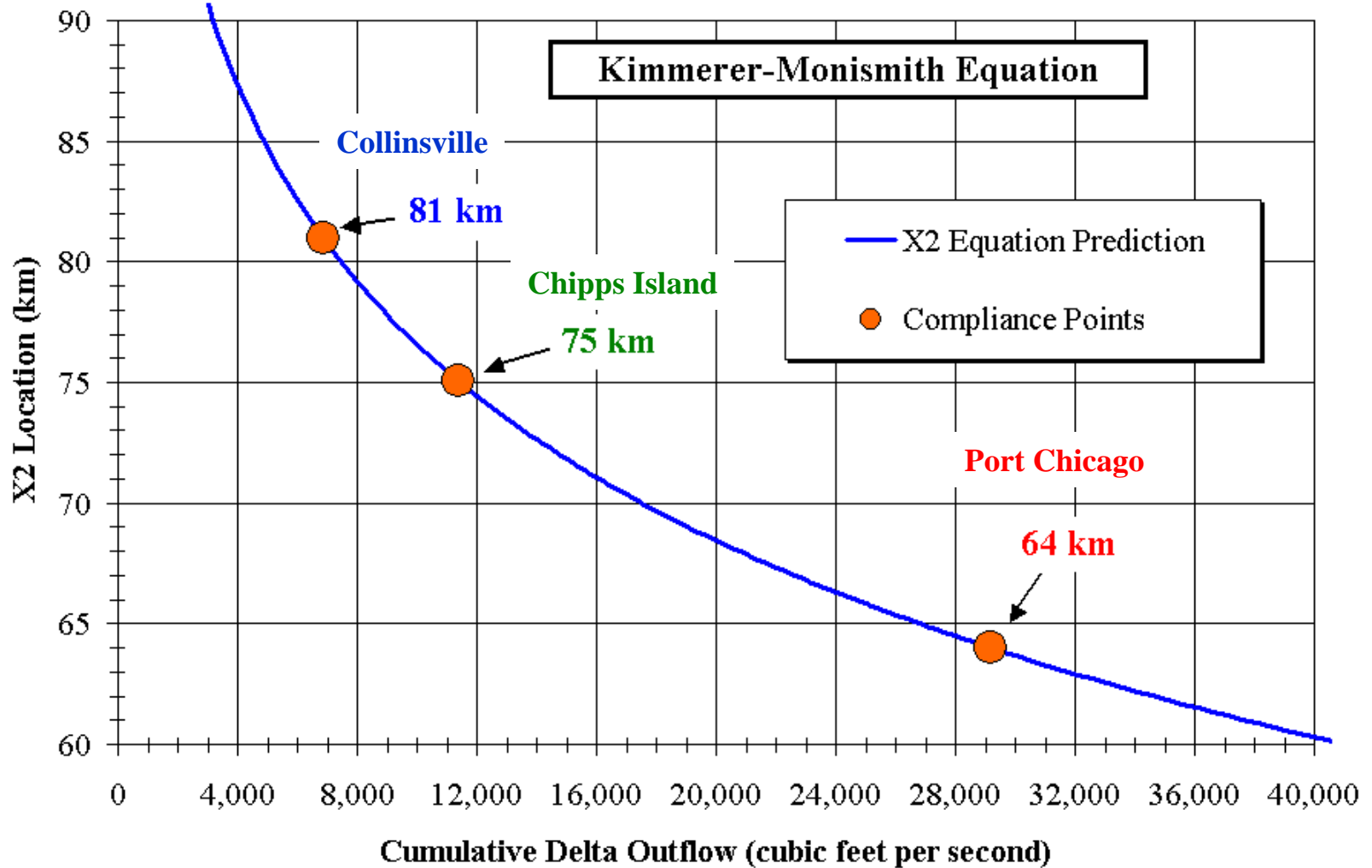
| Compliance Point | Location | X2 | Net Delta Outflow (cfs) |
|-------------------------|--|-----------|--------------------------------|
| Port Chicago | Near Roe Island in Suisun Bay | 64 km | 29,200 |
| Chippis Island | Near Mallard Island EC station | 75 km | 11,400 |
| Collinsville | Near Confluence of Sacramento and San Joaquin Rivers | 81 km | 7,100 |

Very high outflow needed to meet Port Chicago X2

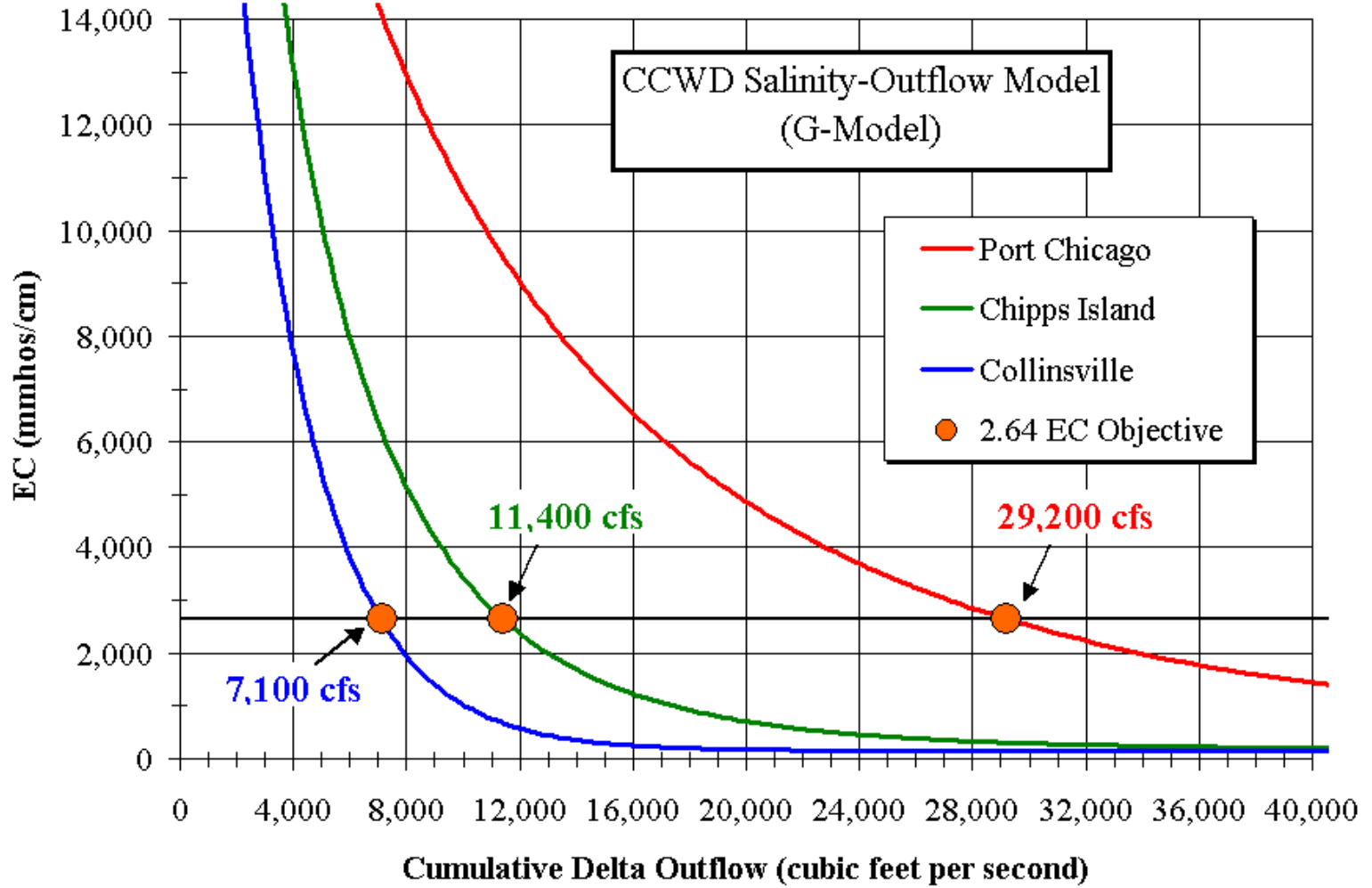




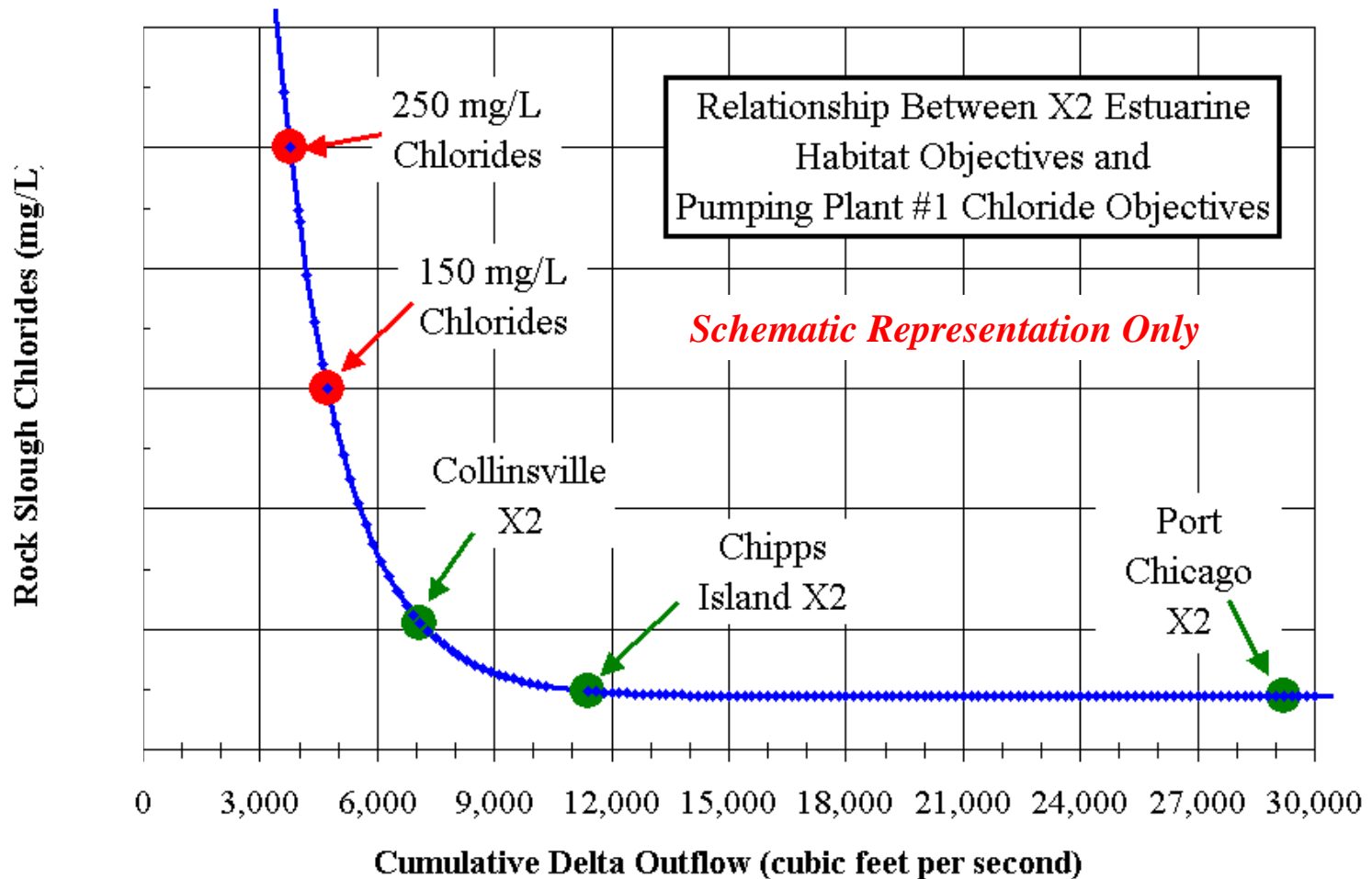
Smaller X2 better for fish and water quality




Outflows Required to Meet 2.64 EC at Each X2 Objective Location



X2 Estuarine Habitat Objective Also Protects Delta Drinking Water Quality



Assumes Outflow held constant for long period (Steady State)

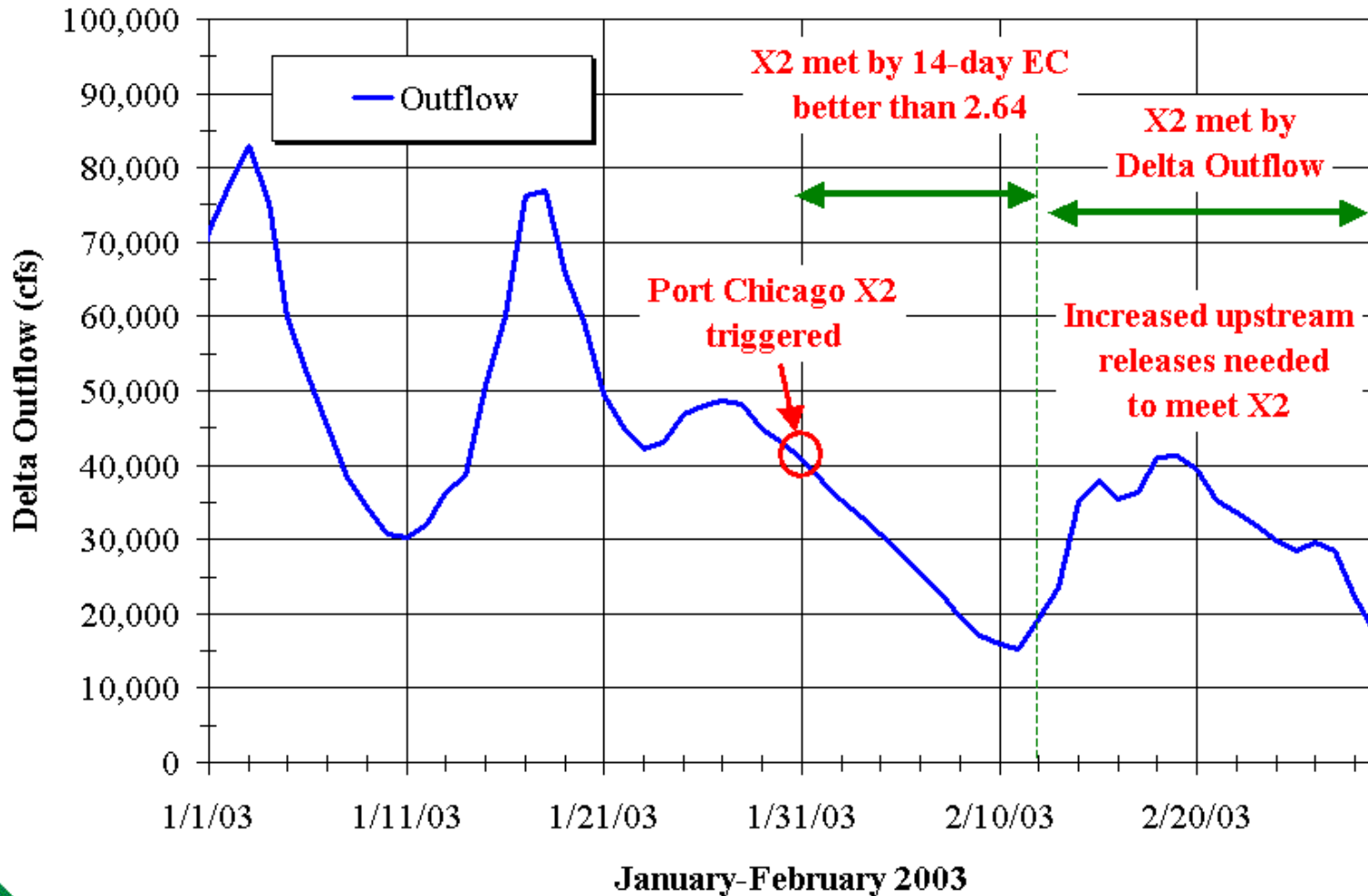


Port Chicago X2 can impact upstream fish species in some cases

- Port Chicago X2 only triggers if 14-day EC on last day of previous month is 2.64 mmhos/cm or less – **not very often**
- In some cases when Port Chicago is triggered, there is plenty of natural storm runoff to meet the required number of days
- However, in some cases, additional releases are needed late in the month from Nimbus Dam on the American River and other tributaries.
- Higher flows of American River can result in stranding of steelhead redds and juvenile fish
 - ❖ February 2003
 - ❖ April 2004

Increased releases to meet Port Chicago X2 can have serious fish impacts

Delta Outflow (DAYFLOW Data)





Summary

- X2 provides protection for drinking water quality in the spring and into the summer
- Any modifications to X2 objectives must not degrade water quality
- Need to consider additional flexibility to Port Chicago X2 requirement to avoid redirected impacts to upstream fish
 - ❖ Stranding of American River fish species

