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**From:** Cathy Marcinkevage - NOAA Federal <cathy.marcinkevage@noaa.gov>  
**Sent:** Monday, April 22, 2019 10:58 PM  
**To:** Joe Heublein - NOAA Federal; Page Vick - NOAA Affiliate  
**Subject:** Sturgeon Pulses in Upper Sac

Hey Sturgeon friends --

The ROC includes a description of winter/early spring ops from Keswick/Shasta. This is specific to the Dec-Feb time frame. We have the following and since Maria questioned it I want to be totally sure it is accurate ;)> :

"Green sturgeon life history timing is such that it is unlikely that green sturgeon will be present in the upper Sacramento River in the December-February period when Reclamation is managing winter – spring minimum flows. Adult green sturgeon migrate up river in March to early April, and spawn from April through July with the median spawning May (Poytress et al., 2015), so they are not expected to be affected by this component of the operation."

Basically, consider that Rec operations of Shasta are muting the natural hydrograph of spring flows (Dec-Feb). Is it correct to state that green sturgeon suffer no ill effects as a result of that muting of potential natural peaks in that time frame?

Thanks!  
Cathy