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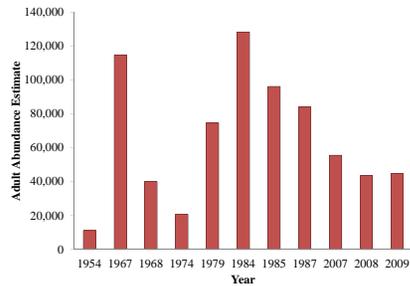
Where do they go? Critical unknowns surrounding White Sturgeon spawning in California

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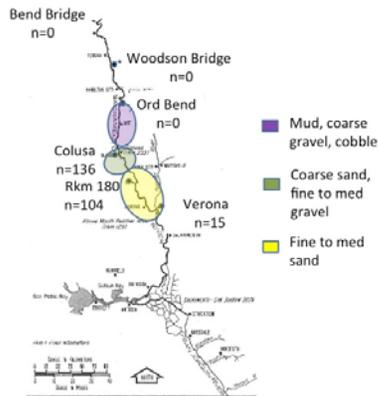
White Sturgeon abundance in the Bay-Delta is highly variable among years.



Data compiled from Kohlhorst *et al.* (1991) and DuBois & Gingras (2011). Estimates for 2007-2009 are averages of 3 abundance estimates made for the beginning, middle, and end of each tagging CDFW period (DuBois & Gingras 2011).

- Variable recruitment likely contributes to fluctuating abundance.
- Stabilizing White Sturgeon abundance may be achieved by enhancing recruitment success.
- But why is White Sturgeon recruitment so variable?

To understand Bay-Delta White Sturgeon recruitment dynamics, we must first determine if we've correctly identified their spawning habitat and substrate.



Modified from Figure 1. Kohlhorst (1976). Bold dots indicate areas where larval sampling occurred and n refers to # larvae captured.

- Most self-sustaining White Sturgeon populations spawn over coarse substrates in hydraulically complex areas with rapid flow.
- However, substrate in the Sacramento River reach where White Sturgeon are believed to spawn consists primarily of sand, mud, and fine gravel. Spawning in the San Joaquin River has been documented over sand.
- White Sturgeon in the Kootenai River and Nechako River are known to spawn over sand or mud. Both populations exhibit persistent recruitment failure.

Could poor substrate in the spawning reach, particularly in dry years, contribute to highly variable Bay-Delta White Sturgeon recruitment?

We propose to use acoustic tagging and DIDSON sonar to “hone in” on White Sturgeon spawning and aggregation sites in the Sacramento and San Joaquin Rivers and the Yolo Bypass



- The Bay-Delta hydrophone array will be used to identify White Sturgeon aggregation areas.
- Aggregation areas will be surveyed with DIDSON sonar to “hone in” and estimate abundance at these sites.
- Egg mat and larval sampling will be conducted to confirm spawning at high use sites in the Sacramento and San Joaquin rivers and Yolo Bypass.
- Substrate sampling will characterize spawning substrates used by Bay-Delta White Sturgeon.

We will work collaboratively with other biologists conducting acoustic biotelemetry research in the Bay-Delta, contributing additional tagged fish and hydrophones that may be used to answer other research questions.

Management Benefits:

- Identify and characterize spawning sites for possible protection
- Estimate adult abundance on spawning sites across years
- If poor habitat is limiting recruitment success, identify possible habitat restoration actions to improve recruitment