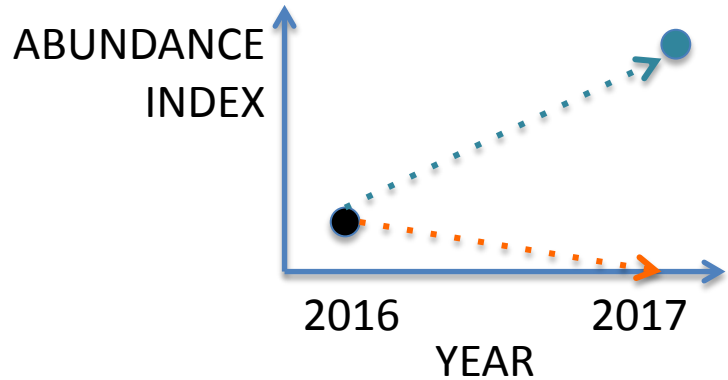


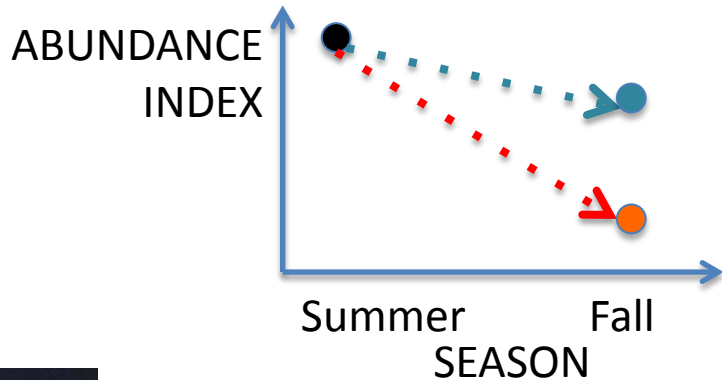


# Delta Smelt are at Grave Risk of Extinction

- To prevent extinction, the population must increase

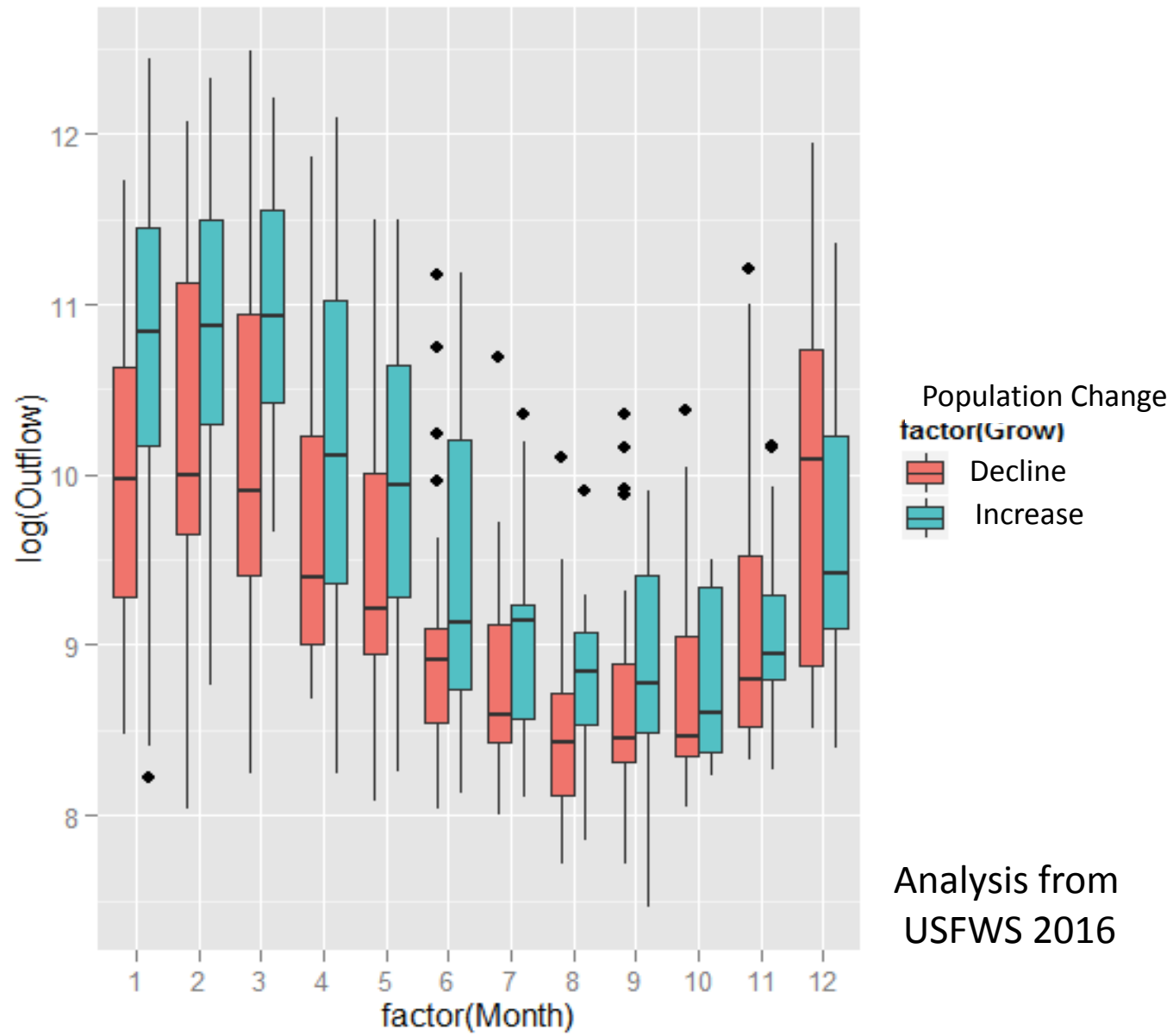
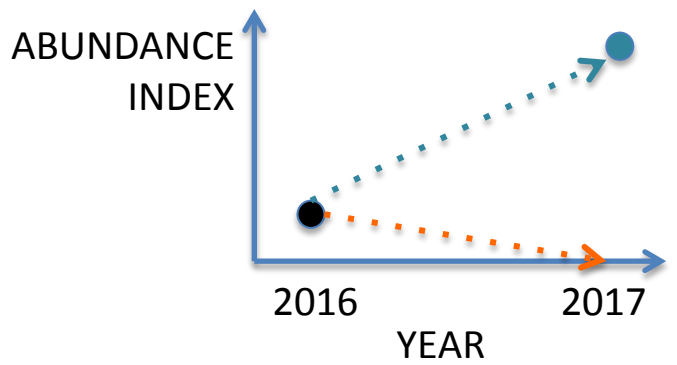


- To increase the population, survival from one life stage to the next must increase



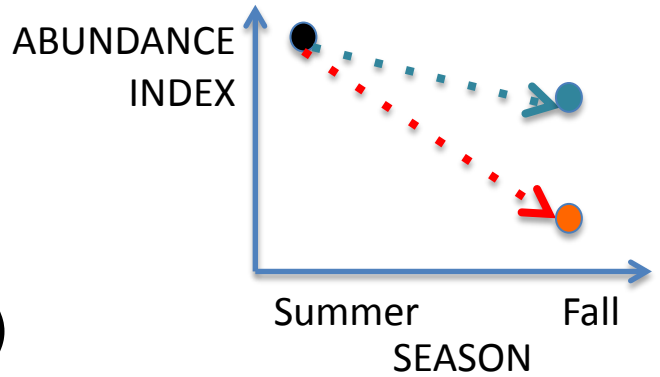
# Delta Smelt Population Responds Positively to Increased Delta Outflow

“...strong support for a role of Delta outflow” on year to year change in Delta Smelt abundance -- USFWS 2016

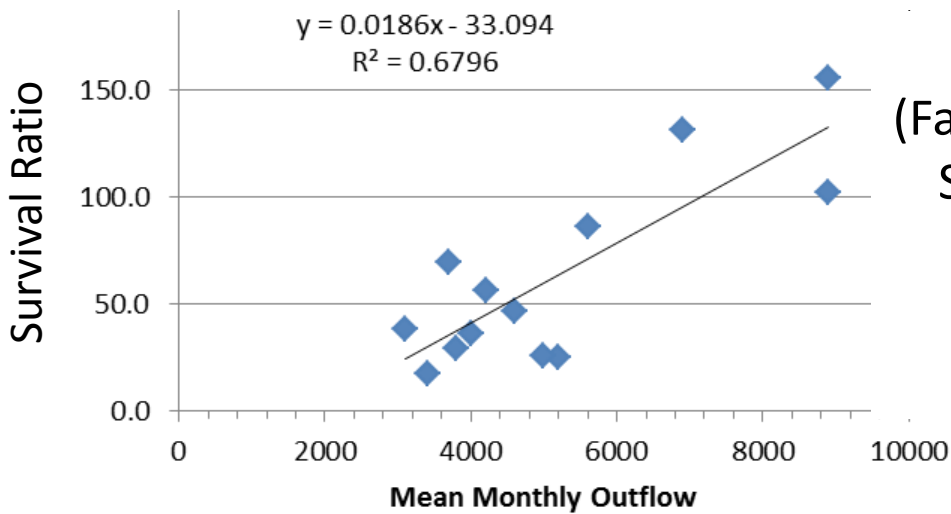




# How Much Does Delta Outflow Matter? (Summer)

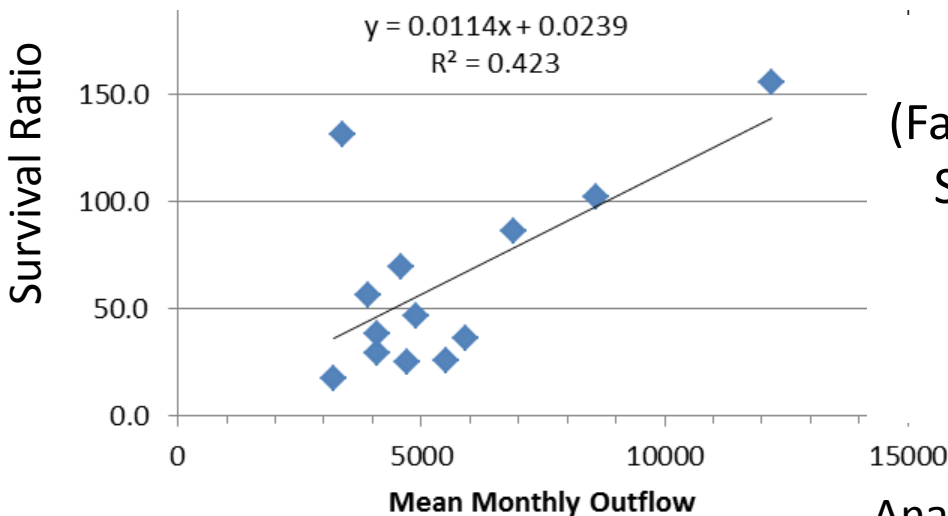


August (2002-2014)



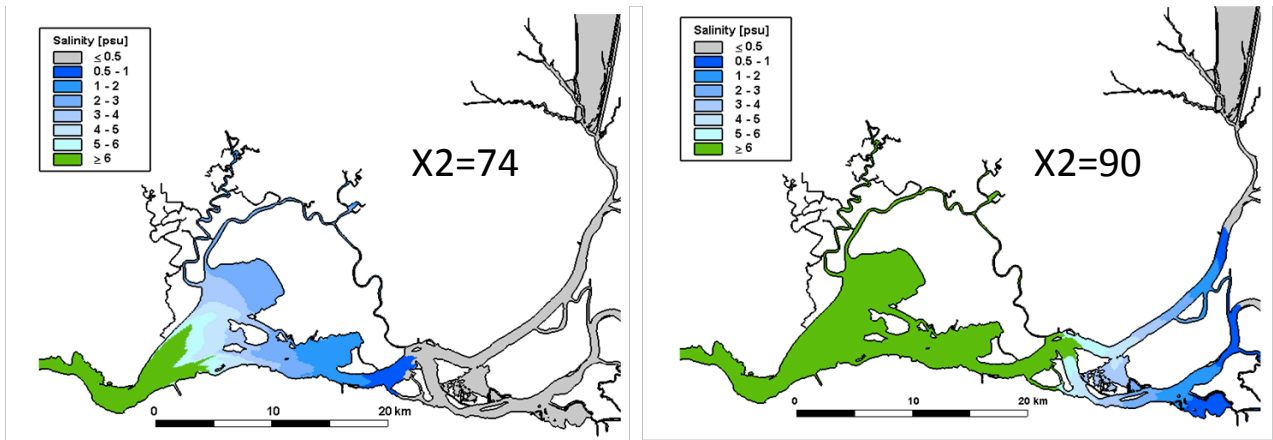
Survival Ratio  
(Fall Midwater Trawl/  
Summer Townet)  
vs. Outflow

September (2002-2014)



Survival Ratio  
(Fall Midwater Trawl/  
Summer Townet)  
vs. Outflow

# Why Does Summer Delta Outflow Matter? (Mechanisms)



“...numerous biological reasons that higher outflow ... would improve conditions for Delta Smelt.” – USFWS 2016

- **Water temperature (late spring through early fall)**
- **Water quality (e.g., reduced frequency of *Microcystis* blooms; summer/fall)**
- **Salinity and habitat position (all year, but particularly summer and fall)**
- **Predation (summer/fall) –**
  - predators may benefit when and Delta Smelt are located in the Delta channel network

In the current context of dire threat to Delta Smelt, understanding the *mechanisms* by which flow affects Delta Smelt populations is not important