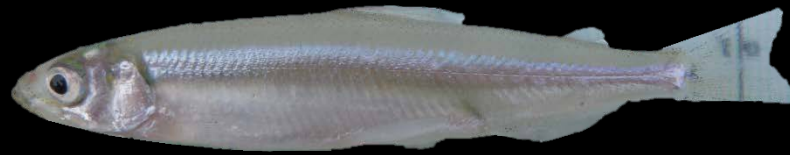


Me Too?



What Have We Learned About Predation on Delta Smelt?



Brian Schreier



Delta Smelt Never Abundant in Striped Bass Diets

- 1957 □ 1961 = **0.4%** of 4,551
- 1963 □ 1964 = **0.4%** of 8,628
- Longfin = **0.09%** of 4,551

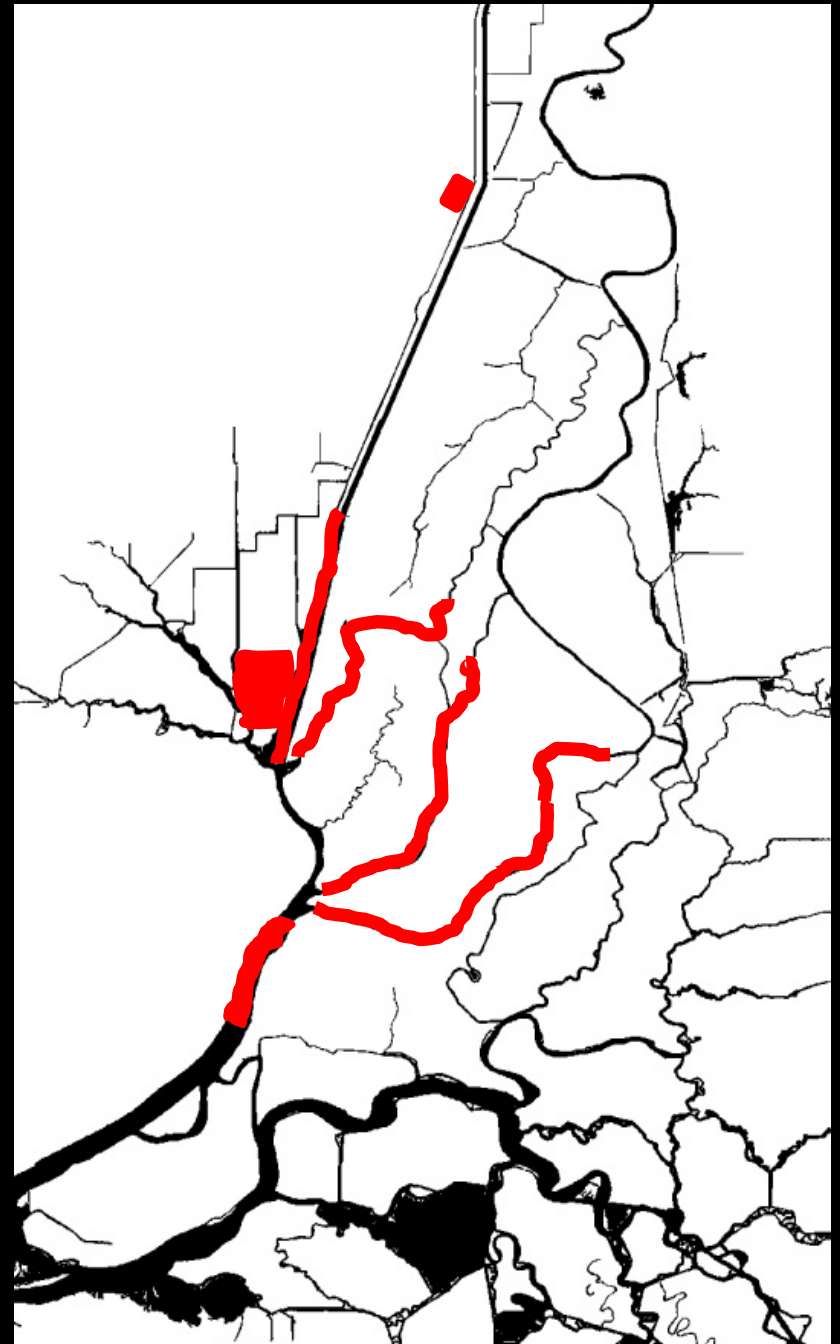


Do Predators Eat Delta Smelt?

- Visual Diet Analyses
 - 569 Striped Bass = 0 smelt prey (Nobriga & Feyrer 2007)
 - 2,300 Largemouth Bass = 0 smelt prey (Conrad, DWR)
- Genetic Diet Analyses
 - 1,044 predators = 9 Delta Smelt (Sean Hayes, NMFS)



North Delta Predation



North Delta Predation



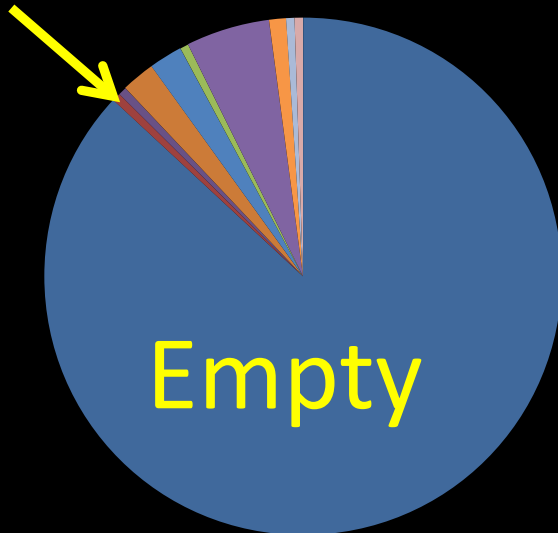
N = 31



N = 52

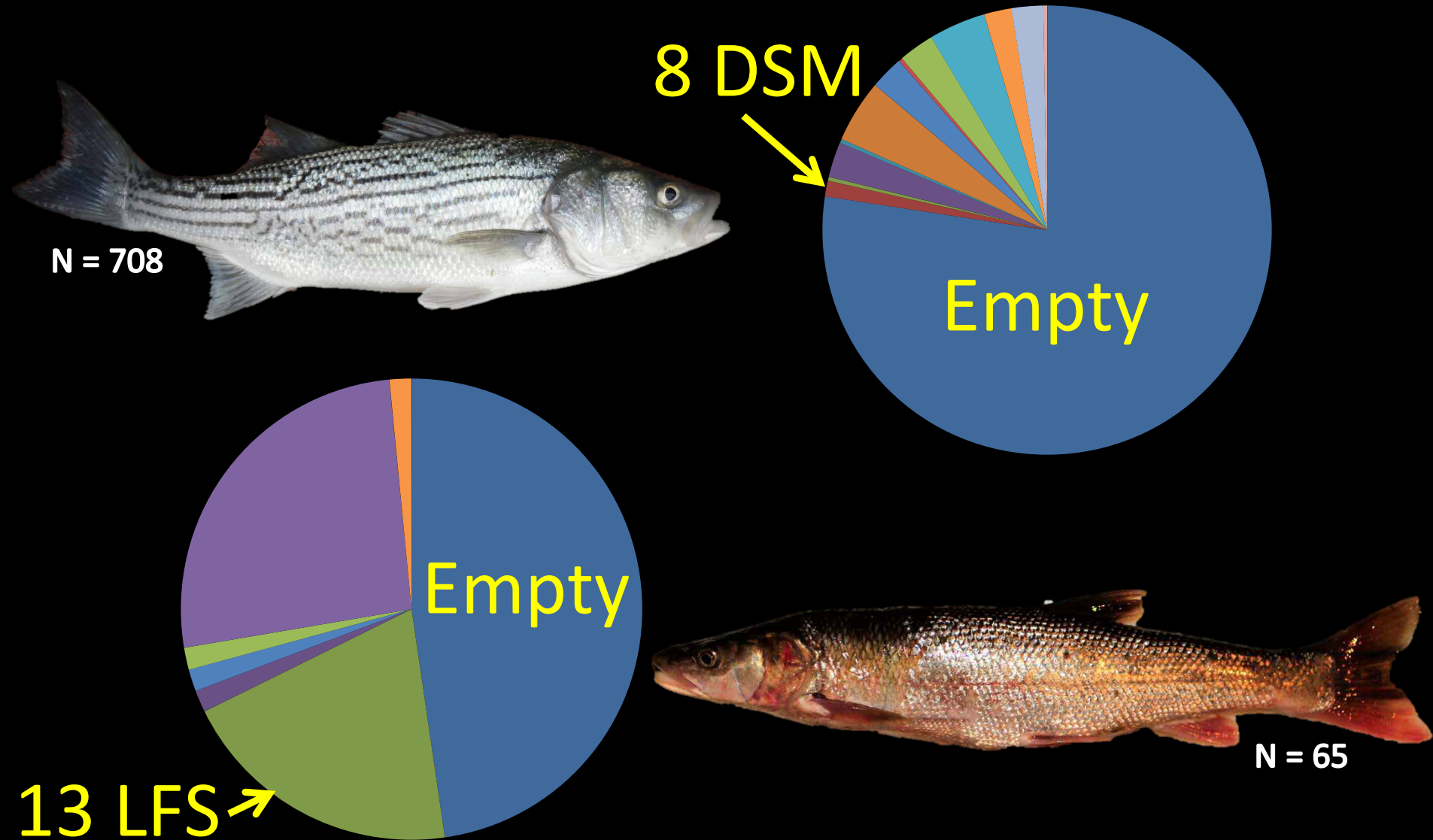


1 DSM

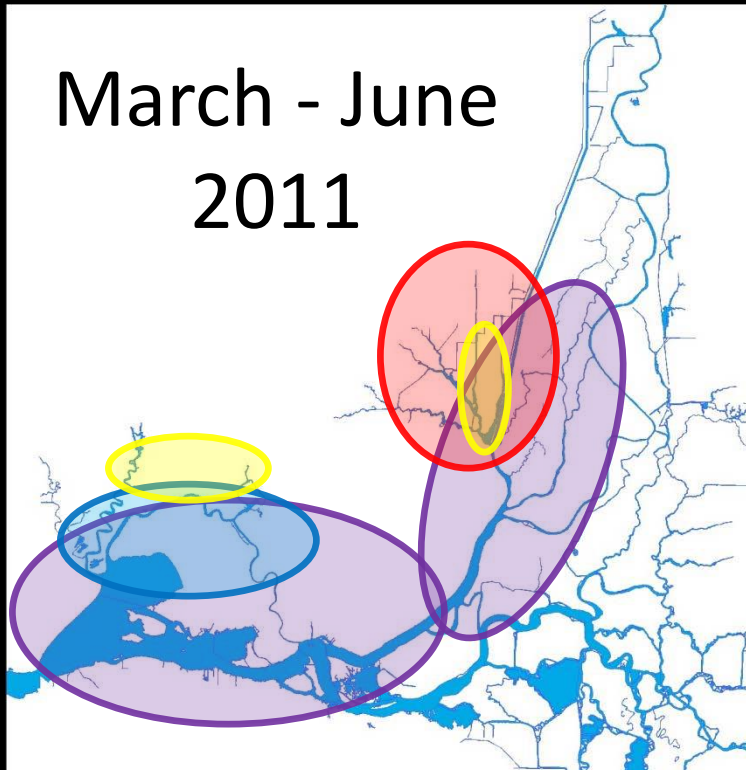


N = 708

North Delta Predation



Who Eats Smelt Larvae?

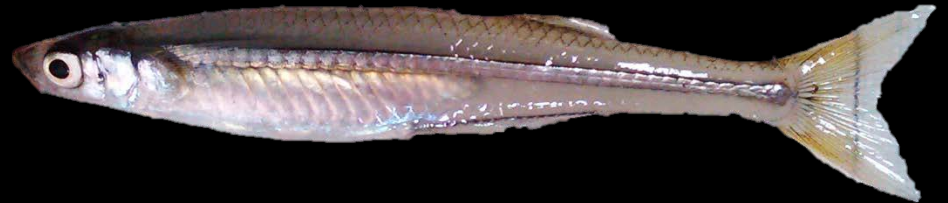


Boat Electrofishing

Beach Seines

Spring Kodiak Trawls

Otter Trawls



Silversides sampled: 559

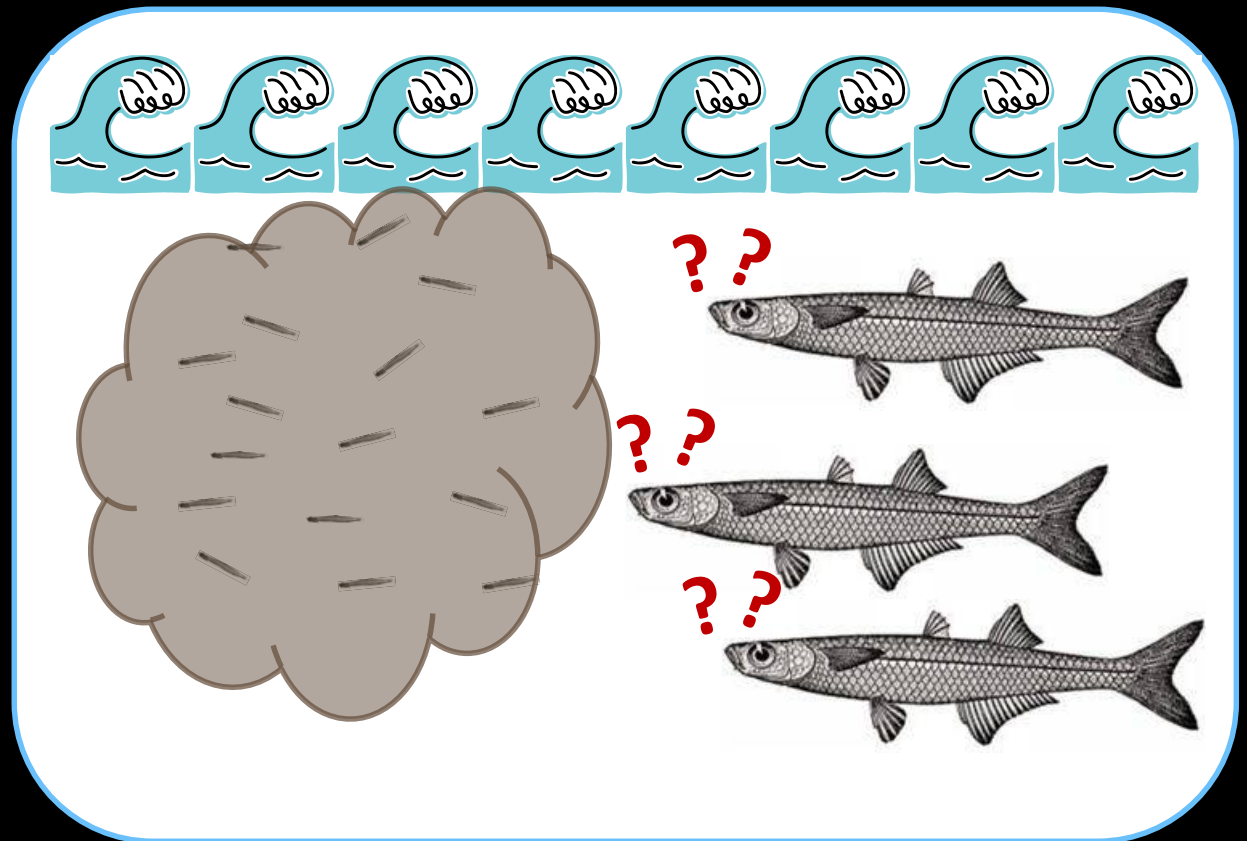
Silversides positive: 69

Modeling MSS Predation

Temp

Turbidity

Salinity

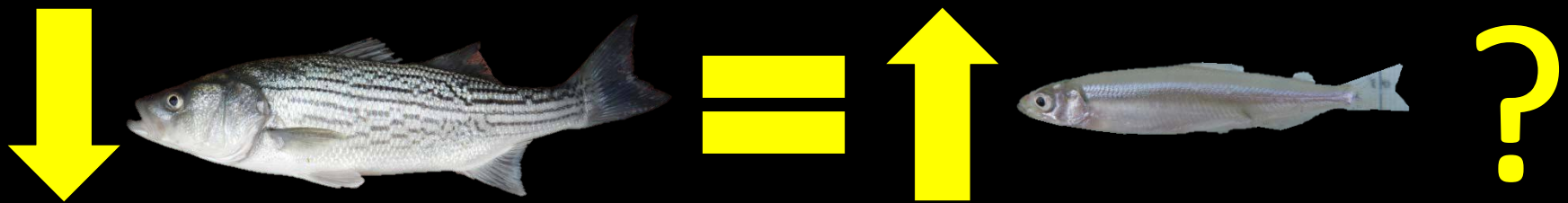


Everyone Eats Smelt Larvae

Species	Tested for smelt DNA	Positive for smelt DNA
Striped bass	73	1
Pikeminnow	44	2
Sunfish	38	1
Largemouth bass	30	2
Gobies	25	1
Threadfin shad	21	1
Chinook salmon	16	1
Golden shiner	10	1
Tule perch	6	1
Exopalaemon shrimp	4	1
Three-spine stickleback	1	1

Ok? Predators Eat Smelt, What Can We Do?

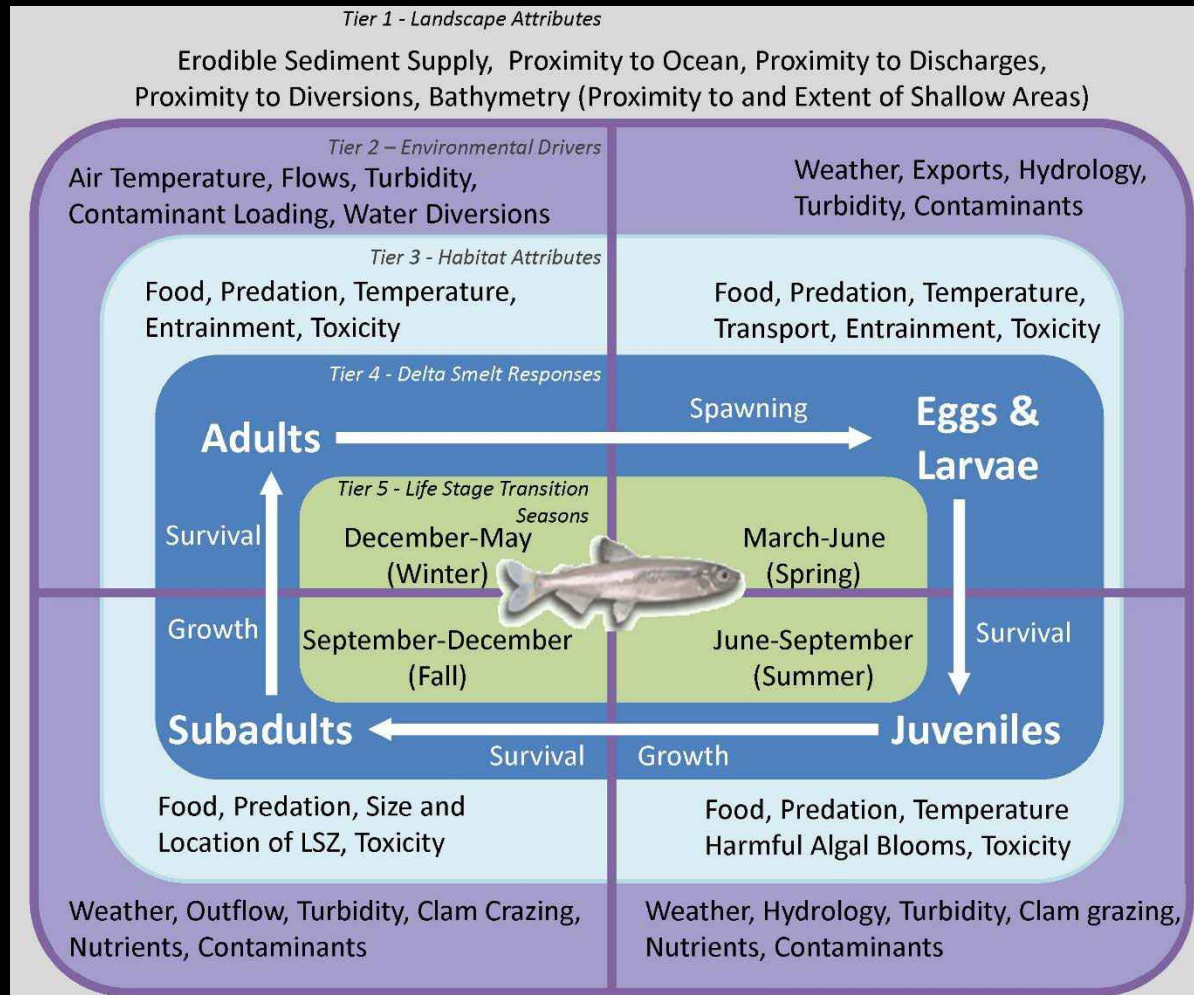
1) Number of Predators Knob



- Is predation limiting?
- Modeling
 - Nobriga et al 2013
- Predator control?
 - Cavallo et al 2013

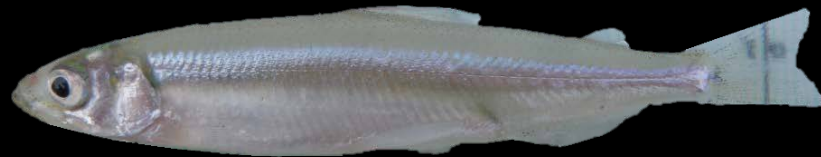
Ok? Predators Eat Smelt, What Can We Do?

2) Habitat Features Knob



Conclusions

- Delta Smelt likely never major food source
- But predation primary source of mortality?
- ? and many species eat them?
- ? but turbidity helps.
- All pre ?drought collapse? data



ME TOO!!!



Questions?



Smelt Predation

- Delta Smelt likely never major food source[?]
- But predation primary source of mortality
- Controlling the number of predators unlikely to help[?]
- But modifying habitat can mediate predation risk[?] like increasing turbidity

