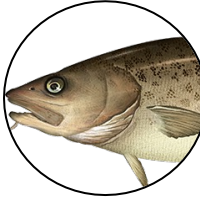
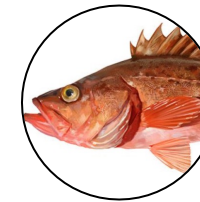


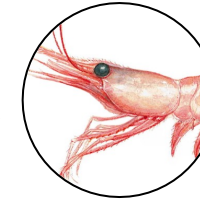
**Kelp, urchin, abalone**  
Population declines and fishery closures due to loss of kelp beds.

**Bocaccio rockfish**  
Enormously high recruitment rebuilt this previously endangered fish stock.

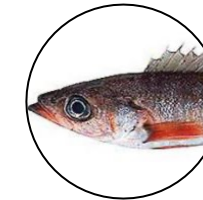


**Pacific cod**  
Population declines due to reduced prey availability and increased metabolic demands.

**Shrimp species**  
Revenues spiked mid-heatwave due to record high prices and strong recruitment before the heatwave.

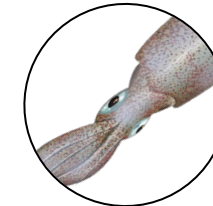
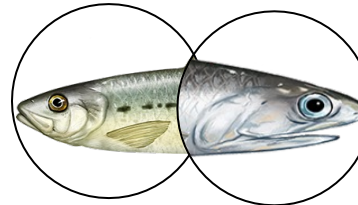


**Dungeness crab**  
Fishery closures due to harmful algal blooms and whale entanglements.

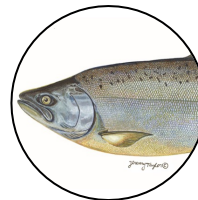


**Shortbelly rockfish**  
Increases in abundance approached bycatch limits in Pacific hake fishery.

**Sardine and anchovy**  
Low sardine productivity and high anchovy productivity reversed expectations for warm years.

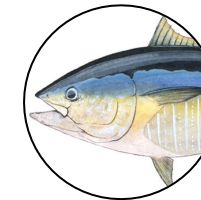


**California market squid**  
Increases in distribution created an unregulated emerging fishery.



**Chinook salmon**  
Overfished due to reduced productivity and model failure.

**Pacific bluefin tuna**  
Increased abundance was a boon for the recreational fishing industry but caused early closures in commercial fishery.



Direct  
negative  
impacts

Indirect  
negative  
impacts

Neutral  
impacts

Positive impacts,  
w/ higher mgmt.  
challenges

Positive impacts,  
w/ lower mgmt.  
challenges

**Social-ecological impact of the heatwave**