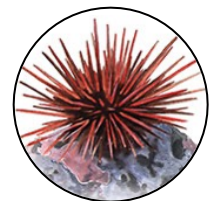


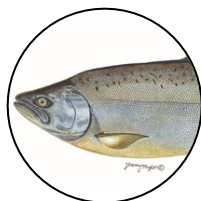
Pacific cod

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



Kelp, urchin, abalone

Population declines and fishery closures due to loss of kelp beds.



Chinook salmon

Overfished due to reduced productivity and model failure.



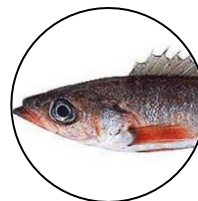
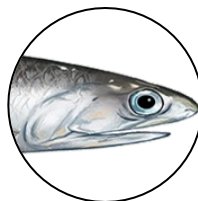
Dungeness crab

Fishery closures due to harmful algal blooms and whale entanglements.



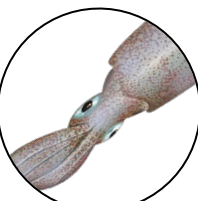
Sardine and anchovy

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



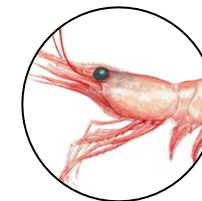
Shortbelly rockfish

Increases in abundance approached bycatch limits in Pacific hake fishery.



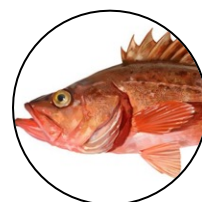
California market squid

Increases in distribution created an unregulated emerging fishery.



Shrimp species

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



Bocaccio rockfish

Enormously high recruitment rebuilt this previously endangered fish stock.



Pacific bluefin tuna

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

Range shifts

Recruitment spikes



Direct
negative
impacts

Indirect
negative
impacts

Positive impacts, with
higher management
challenges

Positive impacts, with
lower management
challenges

Social-ecological impact of the heatwave