

Comments on Groundfish FMP Amendment 23



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Ecological Factors in ACLs

- OY is prescribed as Maximum Sustainable Yield ‘as reduced by any relevant economic, social, or ecological factor.16 USC 1802 Sec. 3(33)(B).
- The FMP must address ecological factors in its OY specifications. (Final Rule 600.310 (e)(3)(iv))
- ACLs must achieve OYs on a continuing basis (600.310 (e)(3)(ii))

Ecological factors to consider

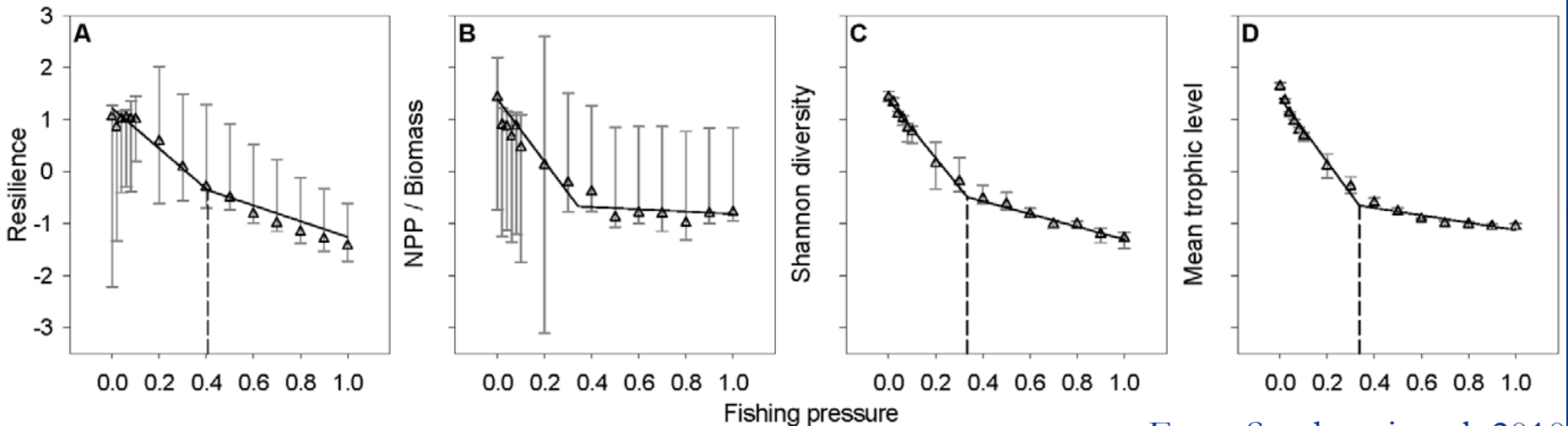
Figure 2-1 in Draft EA:

No Action Alternative Current Harvest Specification Framework		Preliminary Preferred Action Alternative Am. 23 Harvest Specification Framework	
ABC	Overfishing Limit	OFL	Overfishing Limit
	Buffer accommodates scientific uncertainty, management uncertainty, socioeconomic concerns, rebuilding concerns, etc.	ABC	Buffer accommodates scientific uncertainty
OY		ACL	Buffer accommodates management uncertainty, socioeconomic concerns, rebuilding concerns, etc.
HG	Buffer accommodates ad hoc sector allocations and other management objectives	ACT	Buffer could accommodate management uncertainty, inseason catch monitoring uncertainty, ad hoc sector allocations and other management objectives

← Add
“Ecological
Factors”

Ecological Factors

- Species interactions/interaction strengths
- Forage species (keep above B_{msy})
- Climate effects
- Results of ecosystem models
- Integrated Ecosystem Assessments
 - (e.g., EcoSim, Atlantis)



Overfishing Limits Expressed as Annual Catches are Uncertain

$$\text{OFL}_t = F_{\text{MSY}} \cdot B_t$$

- Uncertainty in estimating F_{MSY}
- *Uncertainty in B_t*
- Uncertainty in forecasts (OFL_{t+1} , etc.)
- Uncertainty in spatial processes
- Uncertainty in the ecosystem
 - trophic relationships
 - climate

Probability of Overfishing (P^*)

- Equivalent to % of stocks where overfishing is expected to occur
- Critical factors to consider in setting risk preference
 - Consequences of overfishing
 - Weigh benefits of avoided overfishing vs. costs of increased buffer
 - Decision framework

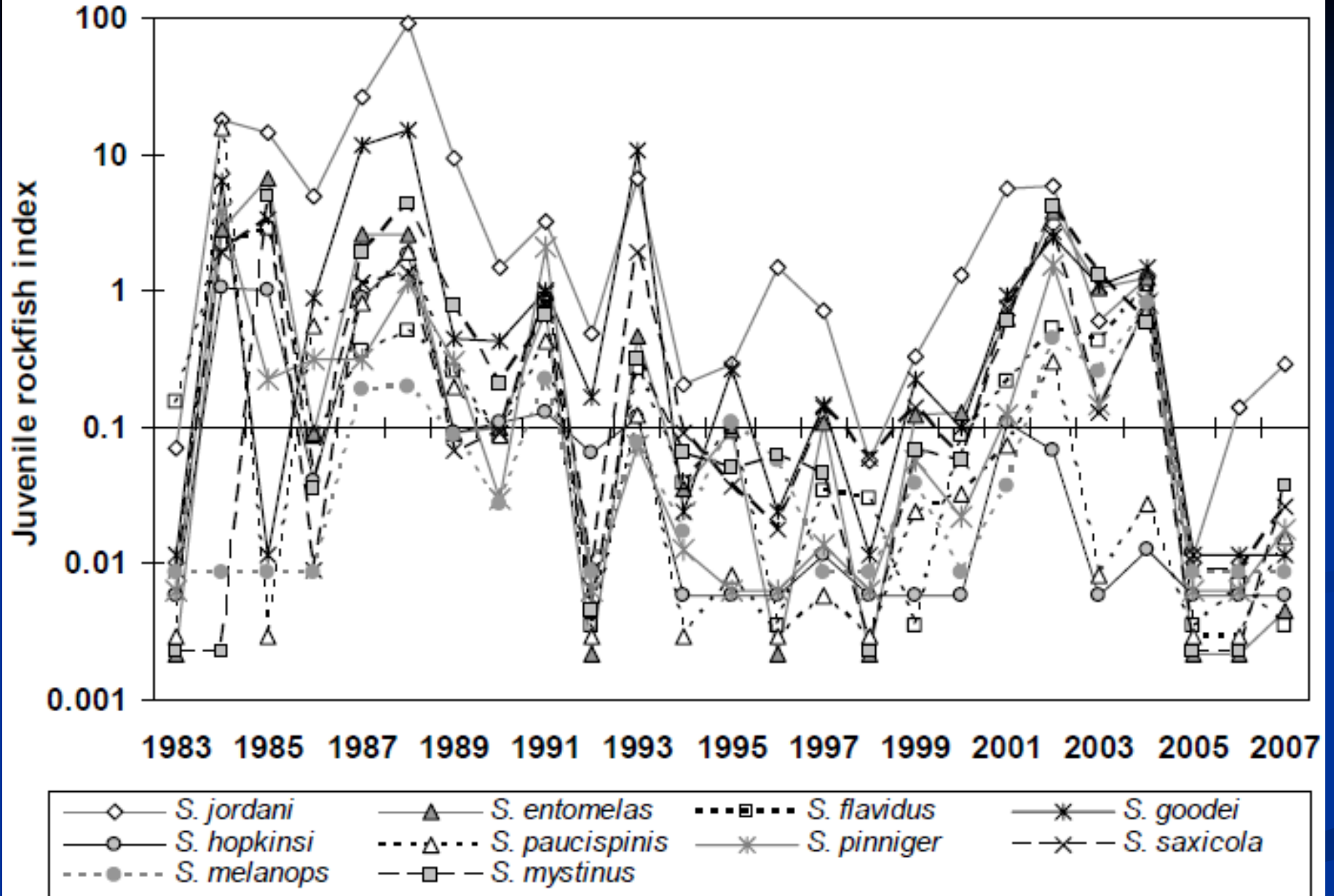
Shortbelly Rockfish (*Sebastes jordani*)



- Major forage species in CA Current
 - Chinook salmon (~60% of identified prey historically)
 - Seabirds (up to 90% diet juvenile rockfish)
 - Marine mammals
- Most abundant pelagic juvenile rockfish of Central California
- No directed fishery, though potential exists
- Minimal bycatch (1-12 mt/yr)



Juvenile shortbelly
rockfish off Mission
Beach, CA



Standardized relative abundance (in log scale) of the ten most frequently encountered species of juvenile rockfish (Sebastes) from the juvenile rockfish survey, 1983-2007. From Field et al. (2010)

Recognizing Ecological Importance as Forage Species

- Option 1: Reclassify as “Ecosystem Component” in the Groundfish FMP and prohibit directed harvest
- Option 2: Leave “in the fishery” as Category 2d species and lower the ACL to maximum catch levels in recent years based on ecological factors