Informational Briefing:

Scientific Uncertainty Buffers, Amendment 23 Technicalities, and Agenda Item I.2

Pacific Fishery Management Council
April, 2010

Presentation Outline

- **Background: Why is the Council Considering This New Level of Complexity?**
- **March Council Meeting questions:**
  - **What is Sigma (σ) and What Role Does It Play?**
  - **What is P* and How Does It Work?**
  - **What are Some Actual Examples?**
    - **Effect of P* Buffers for Black Rockfish, Sablefish, Lingcod, and Other Species**
    - **How Do Old OYs Compare to *P Values?**
- **What is Coming Under Agenda Item I.2?**

Why Are We Doing This?

- **The Re-authorized MSA Contains New Requirements to End Overfishing**
- **New NS1 Guidelines Implementing the Mandate Entail a New Harvest Specification Framework, Which Requires an FMP Amendment (Groundfish FMP Amendment 23)**
- **FMP Amendment Approval and Implementation Mandated by 2011**

New Terminology

2009-10 Harvest Specification Framework		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 inseason catch monitoring uncertainty, ad hoc sector allocations and other management objectives

Which of the Metrics are Science Determinations vs. Policy Determinations?

SSC Scientific Determinations To Be Approved by the Council

- OFL
- Part of the ABC: Quantification of Assessment Variance (σ = 0.36)
- Species or Stock Categorization Based On The Amount and Quality of Data Informing Harvest Specifications (Category 1, 2, or 3)

Council Policy Determinations

- Part of the ABC: Size of Scientific Uncertainty Buffer For All Three Categories of Stocks Based on a Risk Assessment
- P* : Overfishing Probability (P*) is a Risk Assessment Metric

New Regime Implementation Mandated by 2011

- **2011-12 Biennial Specifications Decided in a Three Council Meeting Process (November, April, June)**
  - **OFLs and Range of ABCs and ACLs Tentatively and Ideally Adopted in November**
  - **April:**
    - **Final Adoption of OFLs, ABCs, and ACLs (PPA for Overfished Species Under Agenda Items I.4 and I.6)**
    - **Preliminary Mgmt Measures , PPA for Further Analysis (Agenda Items I.4 and I.6)**
  - **June: Final Action**
- **Amendment 23 Scheduled for Final Action at the June Council Meeting**

March Council Meeting Questions

- What Exactly is Sigma (σ)?
- What is P*, and How Does it Work?
- What are Some Actual Examples?
  - Effect of P* buffers for Black Rockfish, Sablefish, Lingcod, Blue Rockfish, Chilipepper, etc.
- How Do Old OYs Compare to *P Values?
  - What P* Would the Old OYs Correspond To?
- Does the New System Result in Significantly Different Catch Levels Than Under the Old System?

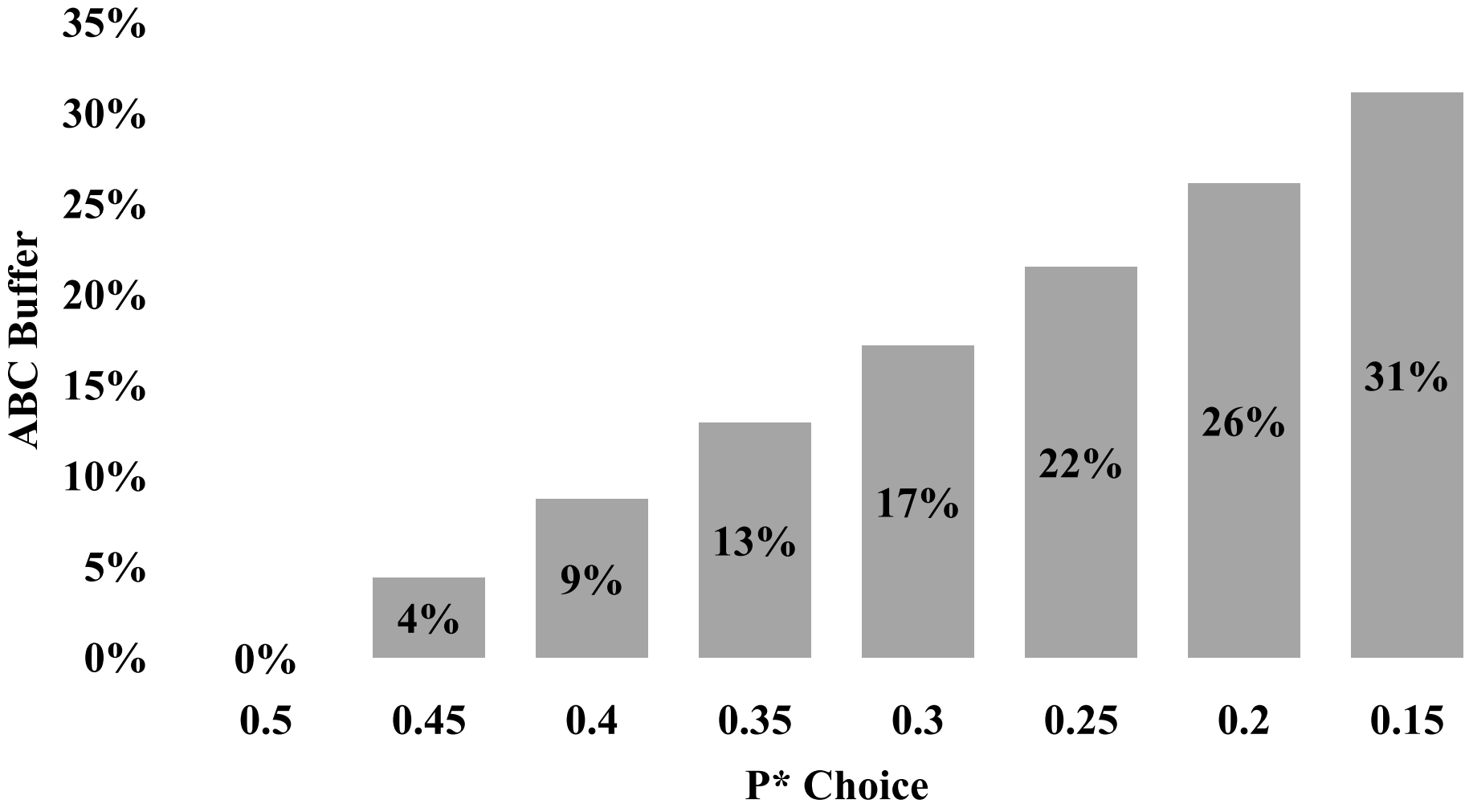
What Exactly Is Sigma (σ)?

- **The Scientific Uncertainty Buffer has Two Parts:**
  - **Scientific Variability between Stock Assessments**
  - **Probability the OFL Point Estimate is Wrong**
- **σ is the Quantification of Stock Assessment Variability**
- **The SSC has Determined σ = 0.36 for Category 1 Groundfish Stocks**

What is P* and How Does It Work?

- **The Scientific Uncertainty Buffer has Two Parts:**
  - **Scientific Variability between Stock Assessments (σ)**
  - **Overfishing Probability (P*)**
- **(P*) is an Overfishing Risk Assessment Metric**
  - **Choosing a P* Completes the Calculation of the Scientific Uncertainty Buffer, the Gap between OFL and ABC**
  - **Probability of Exceeding the OFL Given the Variability Between Stock Assessments (σ)**

ABC Buffers Under Varying P* Levels Given σ = 0.36



Black Rockfish North

2009-10 Harvest Specification Framework		Am. 23 Harvest Specification Framework	
ABC	445	OFL	445
OY	445	ABC	426 (assuming P* = 0.45)
		ACL	426 (assuming ACL = ABC)
HG	NA	ACT	NA

Chilipepper Rockfish

2009-10 Harvest Specification Framework		Am. 23 Harvest Specification Framework	
ABC	2,229	OFL	2,229
OY	2,118 (assuming same 5% reduction from the ABC used in 2009 and 2010)	ABC	2,130 (assuming P* = 0.45)
		ACL	2,024 (assuming same 5% reduction from the ABC used in 2009 and 2010)
HG	NA	ACT	NA

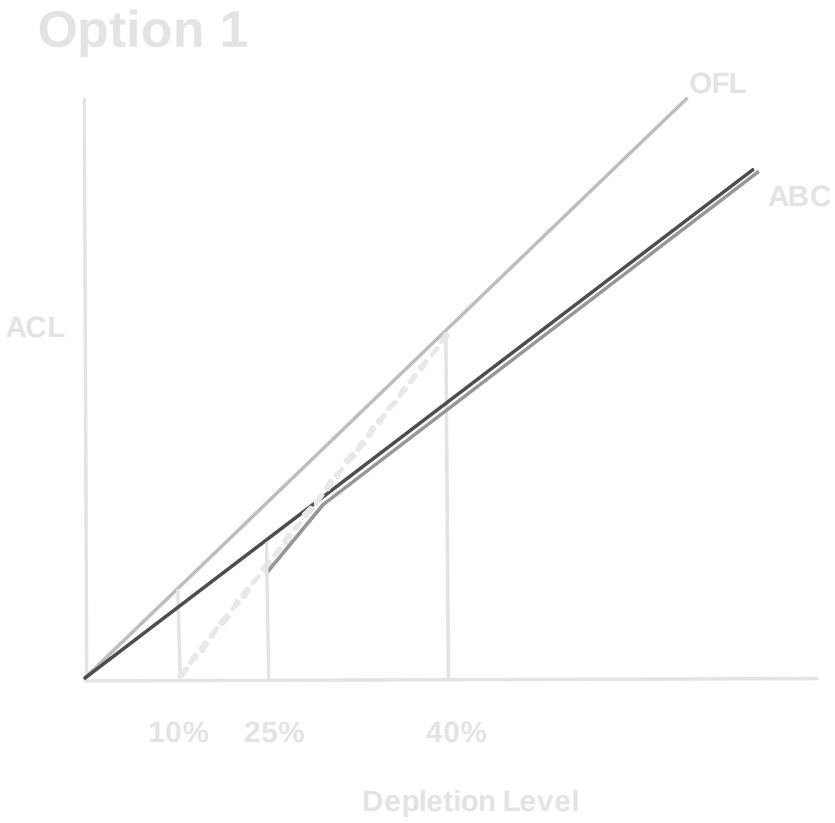
Black Rockfish OR-CA

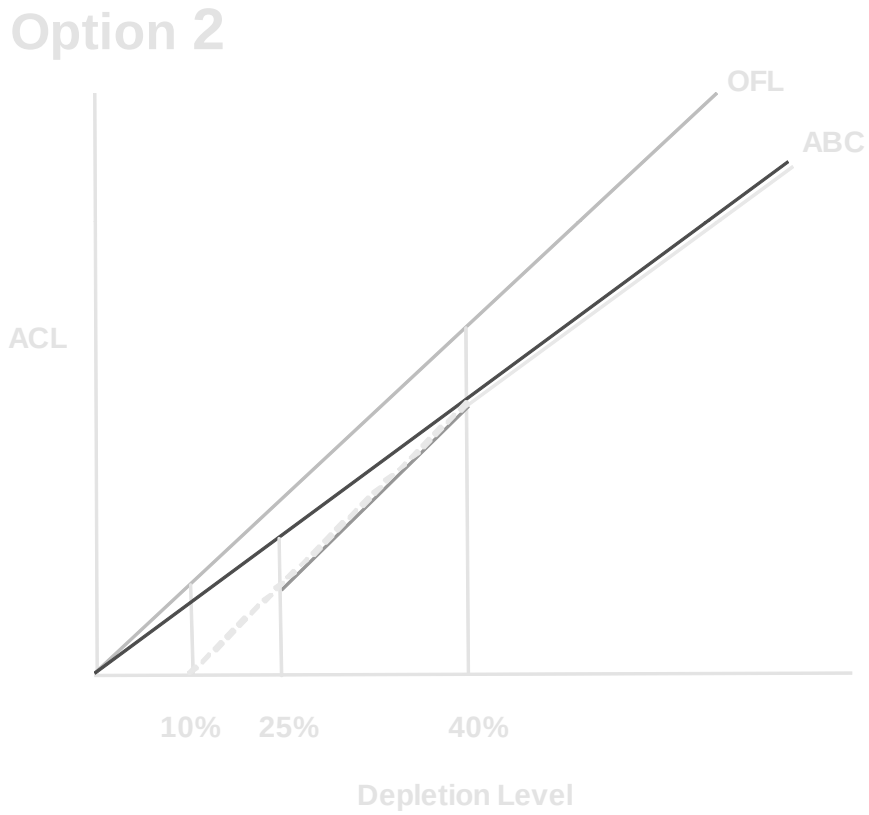
2009-10 Harvest Specification Framework		Am. 23 Harvest Specification Framework	
ABC	1,217	OFL	1,217
OY	1,000 (assuming same constant catch scenario used in 2009 and 2010)	ABC	1,163 (assuming P* = 0.45)
		ACL	1,000 (assuming same constant catch scenario used in 2009 and 2010)
HG	580 (OR), 420 (CA)	ACT	580 (OR), 420 (CA) (assuming same catch sharing as in 2009 and 2010)

Lingcod - Coastwide

2009-10 Harvest Specification Framework		Am. 23 Harvest Specification Framework	
ABC	4,961	OFL	4,961
OY	4,961	ABC	4,742 (assuming P* = 0.45)
		ACL	4,742 (asssuming ACL = ABC)
HG	NA	ACT	NA

Options for the 40-10 Control Rule





Sablefish 40-10 Example (2011)

OFL (mt)	8,808						
Depletion	36.0%						
	Overfishing Probability (P*)						
	0.45	0.40	0.35	0.30	0.25	0.20	0.15
ABC (mt)	8,418	8,040	7,667	7,293	6,909	6,506	6,065
Opt. 1 ACL	8,485						
Opt. 2 ACL	7,296	6,968	6,645	6,321	5,988	5,639	5,256

Sablefish - Coastwide

2009-10 Harvest Specification Framework		Am. 23 Harvest Specification Framework	
ABC	8,808	OFL	8,808
OY	6,109 N; 1,188 S (assumes modified Alt. 5, i.e., option 1 40-10 adj., the same apportionment of the coastwide 40-10 adjusted OY, and a 50% precautionary adjustment in the S as was done in 2009 and 2010)	ABC	8,418 (assuming P* = 0.45)
		ACL	5,253 N; 2,043 S (assumes modified Alt. 5, i.e., option 2 40-10 adj. (PPA under Am. 23), the same apportionment of the coastwide 40-10 adjusted OY as was done in 2009 and 2010, <u>without</u> a 50% precautionary adjustment in the S)
HG	NA	ACT	NA

Considerations for Setting Scientific Uncertainty Buffers

- **P* Approach Has Only Been Considered Up to This Point for Category 1 Stocks**
- **Buffers Should be Progressively Larger for Category 2 and 3 Stocks Due to Greater Scientific Uncertainty**
- **Buffers of 25% and 50% of OFLs for Category 2 and 3 Stocks, Respectively Have Been Proposed But Are Not Mandated**
- **$P^* \leq 0.2$ Determines Buffers $\geq 26\%$ Given $\sigma = 0.36$**

Comparing Approaches for Setting Harvest Specifications

- **In General, Scientific Uncertainty Was Taken Into Account When Setting OYs Under the Old Framework**
- **The Amendment 23 Framework Takes Scientific Uncertainty Into Account When Setting the ABC**

How Do Old OYs Compare to *P Values?

An Example Using Southern Black Rockfish

- The 2010 ABC and OY for Black Rockfish off CA and OR Are 1,317 mt and 1,000 mt, Respectively
- Therefore, the 2010 OY is 76% of the ABC
- Assuming the 2010 OY was an “ABC” Under the New Am. 23 Framework, the Scientific Uncertainty Buffer Would be 24% of the “OFL”
- A 24% Buffer Would Equate to a P* of ~0.225

What Council Tasks are Coming Under Agenda Item I.2?

- **Adopt SSC-Recommended OFLs**
- **Adopt P* and ABC for Cat. 1 Stocks (Non-Overfished)**
- **Adopt Cat. 2 and 3 ABC Buffers**
- **Adopt ACLs for Non-Overfished Species**
  - **Option 1 or Option 2 40-10 Harvest Control Rules?**
  - **ACL Alts. In Tables 2-2 a & b with *Bold Italics* May Have Scientific Uncertainty Adjustments Incorporated, Potentially Double Counted**

Issues and Considerations for Setting 2011-12 ACLs

- **Lingcod**
  - **Coastwide or Area-Specific Specifications?**
  - **Alt. 1 has Scientific Uncertainty Adjustment**
- **Sablefish**
  - **P* for Coastwide ABC**
  - **Option 1 or 2 40-10 Adjustment ?**
  - **Alts. 2, 3 & 5 have Sci. Unc. Adjustment in South**
- **Chilipepper**
  - **2009-10 Spex Were Incorrectly Applied in the South (Assessment for CA & OR)**
  - **Ave. 1998-2008 Catch in South was 94%**

ACL Considerations (Cont.)

- **Splitnose**
  - **Manage with Stock-Specific Specifications or in the Slope Rockfish Complexes (SQ is Stock-Specific ABC & OY in S and Within Complex in N)**
  - **Contributes ~58% of Minor Slope Rockfish North Complex ACL**
- **Shortspine Thornyhead**
  - **Set Coastwide OFLs/ABCs and Area-Specific ACLs**
  - **Alt. 1 ACL has Sci. Unc. Adj. in South**

ACL Considerations (Cont.)

- **Longspine Thornyhead**
  - **Set Coastwide OFLs/ABCs and Area-Specific ACLs**
  - **Alt. 1 ACL has Sci. Unc. Adj. in North and South**
- **Greenstriped**
  - **Manage with Stock-Specific Specifications or in the Shelf Rockfish Complexes**
  - **Contributes 56% to N Shelf Complex and ~10% to S Shelf Complex**

ACL Considerations (Cont.)

- **Starry Flounder**
  - **Alt. 1 ACL has Sci. Unc. Adj.**
- **Other Fish Complex Specifications are Problematic**
- **General Considerations**
  - **ACLs Can be Set Equal to ABCs for Non-Overfished Species Since Scientific Uncertainty Buffers are Incorporated in ABCs**
  - **Exceptions are Overfished Species and Precautionary Zone Species (i.e., Sablefish and Blue RF) Under the Option 2 40-10 Adj.**