Productivity Susceptibility Analysis (PSA)
Tool overview and preliminary findings

ERA Workshop
Long Beach, CA | June 15, 2017

Overview

- Share information about PSA tool and process
- Share draft results
- Discuss feedback, next steps (in next agenda item)

Overview: OST Pilot Project

PSA: Select and apply a Productivity Susceptibility Analysis (PSA) on target species

ERA: Customize and pilot a habitat and bycatch Ecological Risk Assessment and document lessons learned

Scope of PSA Project

Need: A rapid, systematic, quantitative approach to assess risk to CA marine fisheries with varying amounts of available information to assist with management prioritization

Request: Conduct PSA on 45 fisheries, representing 36 state-managed marine species

Components:
1. Select a Productivity-Susceptibility Analysis (PSA)
2. Conduct PSA with CDFW experts (consultant led)
3. Share results and hear feedback from community

PSA Overview

What is it?

- Widely utilized risk assessment tool for understanding relative risk to *target species*

- Established NOAA PSA methodology

- NOAA customized PSA for US fisheries

- Drawing from other PSA methodologies

- "Off the shelf approach" - Did not adapt or change methodology for CA fisheries

- Publicly available

What a PSA Does…

- Assesses potential vulnerability of stocks to fishing activities **relative** to other assessed stocks

- Assesses both **data-poor and data-rich** species within the same analysis

- Alerts managers to fisheries that are likely to be **most sensitive** to a particular method of fishing

- Useful for a **baseline comparison among fisheries** with varying levels of available information

- Can be conducted alone or as part of a series of data analyses on vulnerability

Risk to Target Species – NOAA PSA

- Widely utilized risk assessment tool for understanding relative risk to *target species*

- NOAA customized PSA for US fisheries

- "Off the shelf approach" - Did not adapt or change methodology for CA fisheries

- Publicly available

How can information and results be used?

- Assist with focusing management attention (e.g., review, action, or data collection) on higher risk fisheries
- PSA is anticipated to be a primary basis for the initial priority list of fisheries presented in the draft amended MLMA Master Plan
- *Does not:*
  - provide information on the current status of a stock, only the potential vulnerability to fishing
  - assess *absolute* risk
  - specify harvest guidelines or management actions

Process

Selected PSA method: NOAA version

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CDFW identified "units of analysis"
45 species/gear/sector combinations
(e.g., spiny lobster, trap, commercial)

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Scoring: first round (MRAG)

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Review/input: CDFW fishery experts

⬇

Peer review: OST-led

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Results sharing: Stakeholder workshops (today)

How PSA is Scored

Risk is based on two characteristics:

1. Productivity - the rate at which the fished species can recover after potential depletion

**2. Susceptibility** - extent of the impact due to the fishing activity

Productivity Attributes

- Population growth rate
- Max age
- Max size
- Growth rate
- Natural mortality
- Breeding strategy
- Recruitment
- Age a maturity
- Tropic level

Susceptibility Attributes

- Areal (Geographical) overlap
- Geographic concentration
- Vertical overlap
- Seasonal migrations
- Schooling behavior
- Morphology
- Desirability (Value)
- Management strategy
- Fishing rate
- Spawning biomass
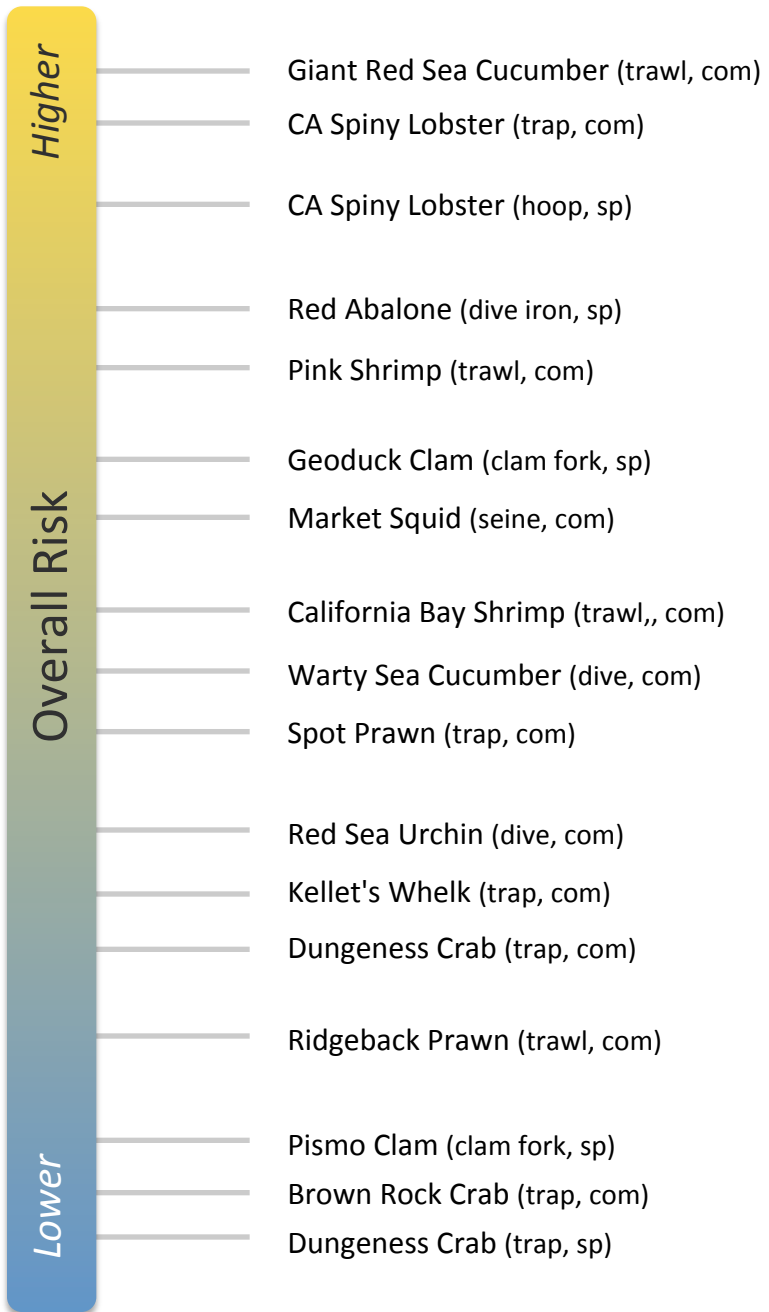- Survival after capture
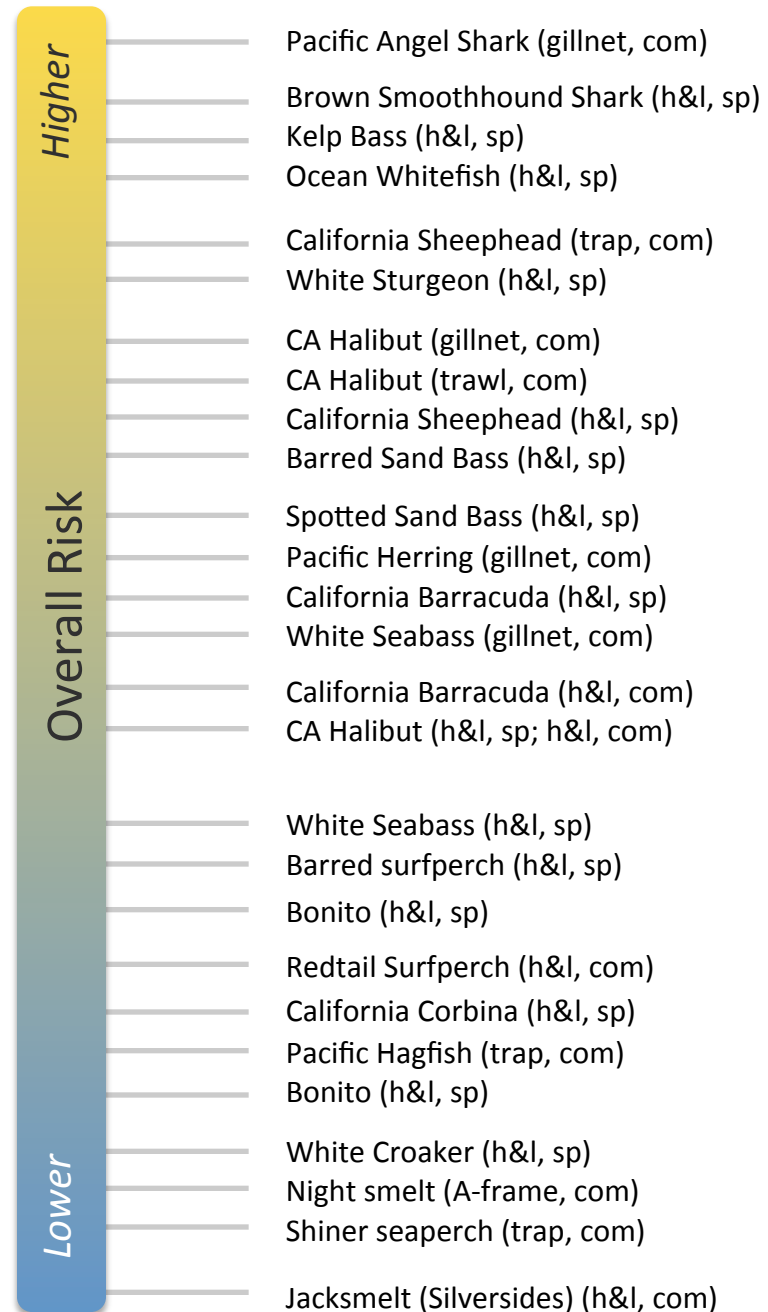- Impact on habitat

Interpreting PSA Plots
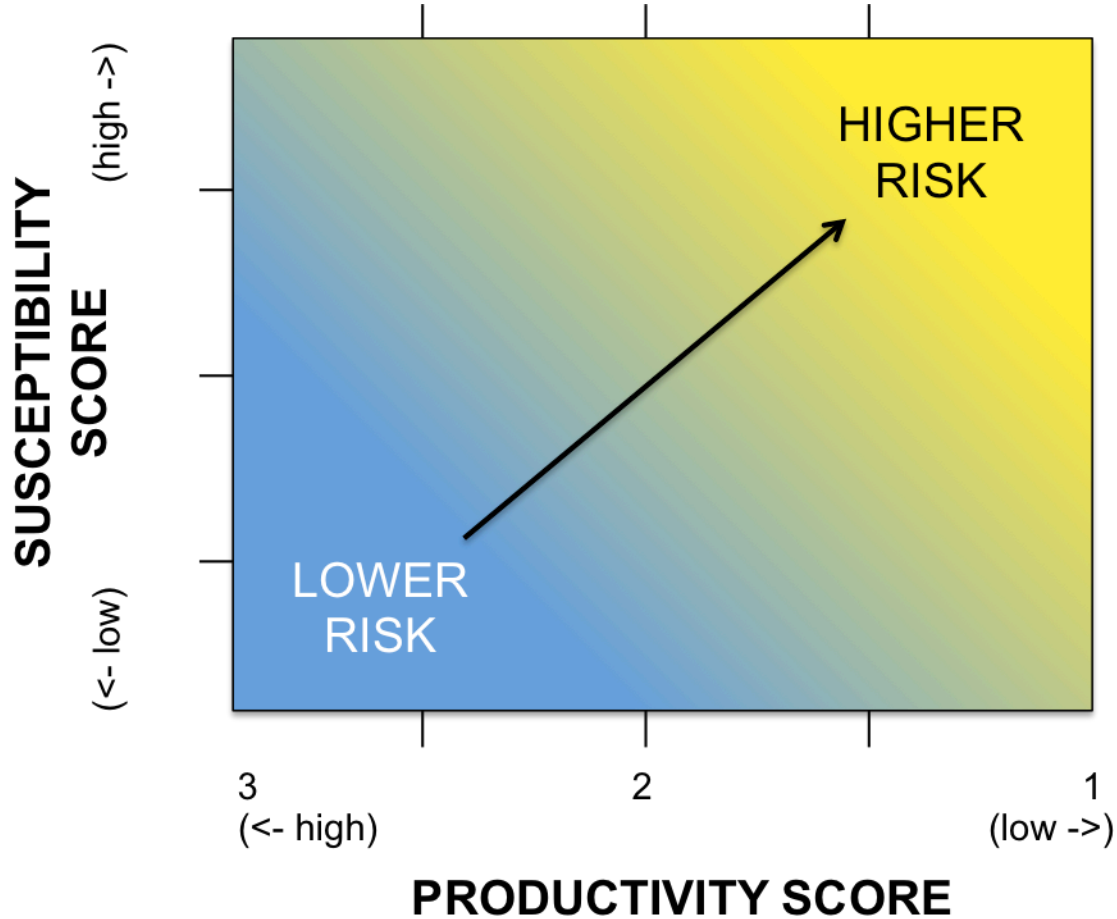
Draft PSA Results

- CDFW still in process of considering information gathering projects and their utility in the master plan amendment
- If used, will be one of several factors that affect the overall priority list for management action

Invertebrate Fisheries

Overall Risk

Higher

Giant Red Sea Cucumber (trawl, com)

CA Spiny Lobster (trap, com)

CA Spiny Lobster (hoop, sp)

Red Abalone (dive iron, sp)

Pink Shrimp (trawl, com)

Geoduck Clam (clam fork, sp)

Market Squid (seine, com)

California Bay Shrimp (trawl,, com)

Warty Sea Cucumber (dive, com)

Spot Prawn (trap, com)

Red Sea Urchin (dive, com)

Kellet's Whelk (trap, com)

Dungeness Crab (trap, com)

Ridgeback Prawn (trawl, com)

Pismo Clam (clam fork, sp)

Brown Rock Crab (trap, com)

Dungeness Crab (trap, sp)

Lower

Finfish Fisheries

Overall Risk

Higher

Pacific Angel Shark (gillnet, com)

Brown Smoothhound Shark (h&l, sp)
Kelp Bass (h&l, sp)
Ocean Whitefish (h&l, sp)

California Sheephead (trap, com)
White Sturgeon (h&l, sp)

CA Halibut (gillnet, com)
CA Halibut (trawl, com)
California Sheephead (h&l, sp)
Barred Sand Bass (h&l, sp)

Spotted Sand Bass (h&l, sp)
Pacific Herring (gillnet, com)
California Barracuda (h&l, sp)
White Seabass (gillnet, com)

California Barracuda (h&l, com)
CA Halibut (h&l, sp; h&l, com)

White Seabass (h&l, sp)
Barred surfperch (h&l, sp)
Bonito (h&l, sp)

Redtail Surfperch (h&l, com)
California Corbina (h&l, sp)
Pacific Hagfish (trap, com)
Bonito (h&l, sp)

White Croaker (h&l, sp)
Night smelt (A-frame, com)
Shiner seaperch (trap, com)

Jacksmelt (Silversides) (h&l, com)

Lower

* Not to scale, simply shows order of fisheries alongside each other

Comparing Methods

- Both tools used to assess potential relative risk
- Similar options and mechanisms for scoring and stakeholder engagement

Pilot PSA
- Utilized established NOAA methodology
- Focused on impacts to target species
- Widely used

Pilot ERA
- Customized ERA conducted in Puget Sound and Monterrey Bay
- Stands on shoulders of PSA
- CDFW requested bycatch and habitat assessment
- OST/NOAA included target component

Questions?

- Any questions about what a PSA is? The relationship between PSA and ERA?
- Do the PSA scores reflect your own understanding of these fisheries? Any surprising results?