Review and Consideration of Draft Management Strategy

Recreational Red Abalone FMP Project Team

Meeting #3: Discussion of Draft Management Strategies

Tuesday, August 27, 2019

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Questions to consider during this presentation:

Management strategy (MS) has 3 parts: data collection, data analysis, and a harvest control rule (i.e., decision tree)

- Is the management strategy (MS) clear and easy to follow?
- Are there aspects of the MS that should be revised?
- How should MS(s) be informed by MSE?

Considerations to keep in mind during this presentation:

- As a draft strategy, various reference points and related criteria should be thought of as placeholders; the Management Strategy Evaluation will be used throughout this process to understand the trade-offs associated with selection on a final reference points.

- Project Team discussions this afternoon will help to inform decisions on specific reference points and criteria.
    - Modelers are seeking your guidance and input on these draft ideas.

Draft management strategy reflects peer review, PT and Commission feedback in the following ways:

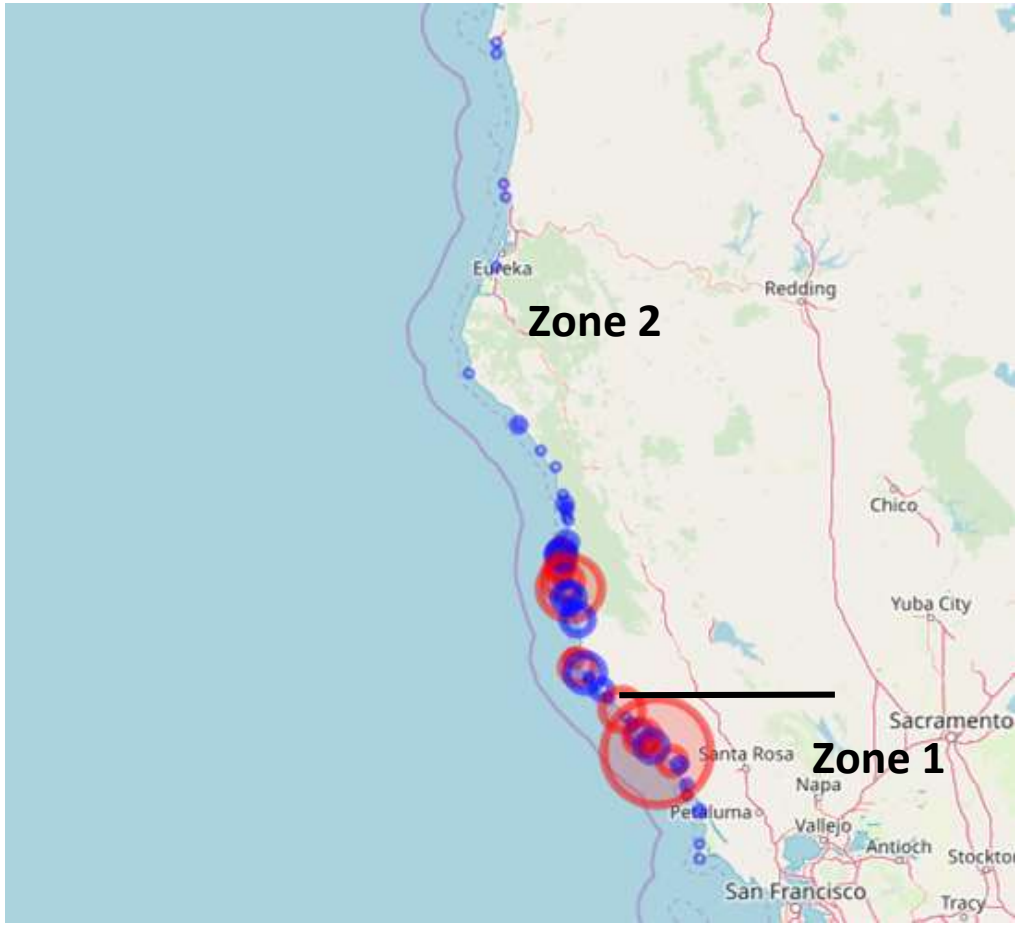
- Multiple indicators are essential
- Provide opportunities for fishing
- Enable citizen scientists to engage in data collection
- Scope must include triggers enabling both de minimis and open access fisheries (if/when ecological conditions permit)
- De minimis requires triggers

How are indicator colors calculated?

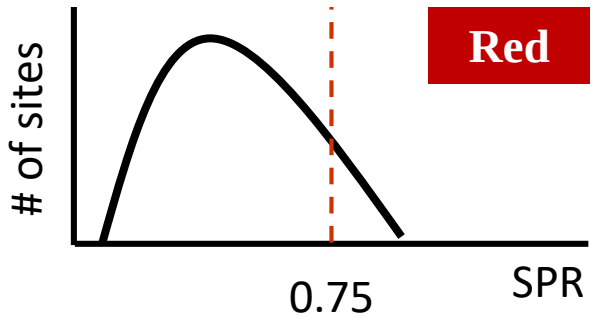
- Spawning potential ratio (SPR):

0.44
0.55
0.57
0.62
0.68
0.78
0.79
0.82
0.85
0.92

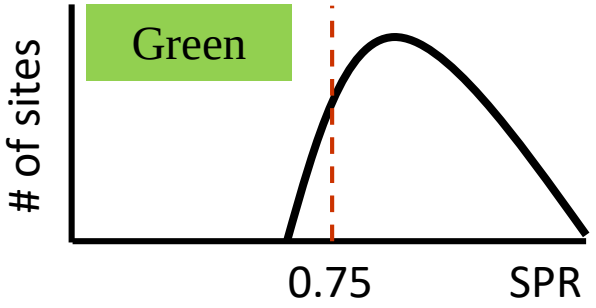
- How many SPRs are above target reference pt?
- 50% are > 0.75 SPR



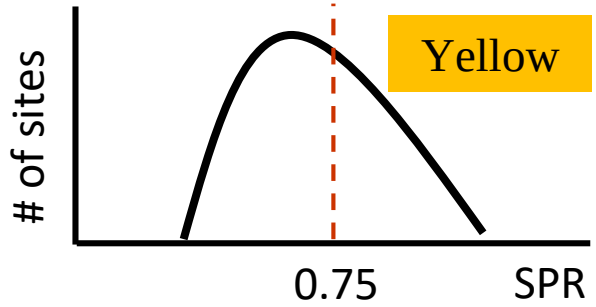
How are indicator colors calculated?



- If > 75% of SPR estimates fall below 0.75, RED



- If < 25% of SPR estimates fall below 0.75, GREEN

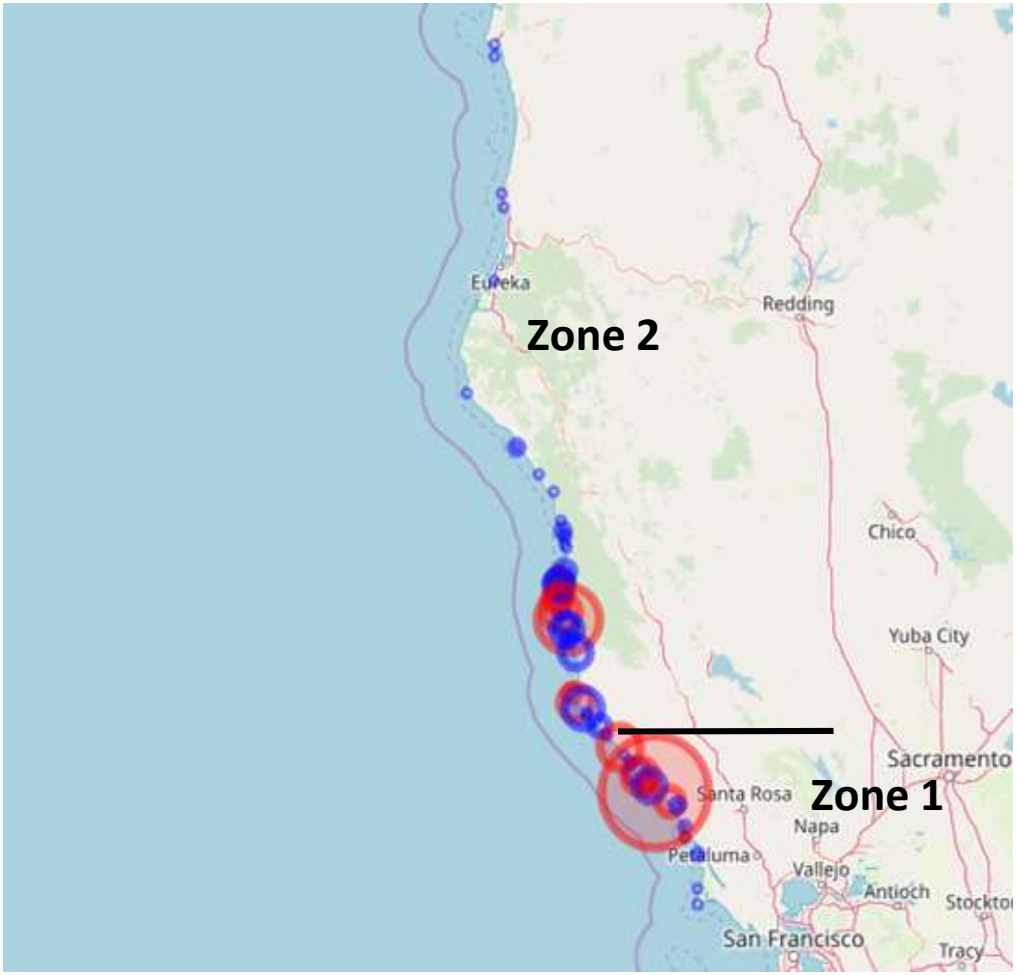


- Otherwise, YELLOW

How are indicator colors calculated?

- Density confidence interval (CI):

0.21 - 0.44
0.22 - 0.51
0.27 - 0.32
0.29 - 0.39
0.32 - 0.43
0.32 - 0.45
0.34 - 0.54
0.39 - 0.58
0.53 - 0.67



- How many are above limit reference pt?
- 100% are > 0.2 / m2

Green

How are indicator colors calculated?

- *Ocean Temperature* – Nearshore ocean temperatures at 30-feet (10-m) in Mendocino County <15ºC for all but three days in the previous calendar year (subtidal temperature loggers) – Green Light

- *Canopy-Forming Kelp Abundance* – The total area of surface kelp in either of the counties is > 30% of historic maximum extent (CDFW kelp aerial surveys or other comparable remote sensing tools tracking kelp surface area) – Green Light

- *Sea Urchin Density* – The combined densities of red and purple sea urchins < 5 urchins / m2 – Green light

- Body condition (productivity) indicator: Abalone should not be starving such that more than 95% of all abalone ($n \geq 300$ abalone sampled should be a minimum target sample size) within at least 4 sites within a fishing zone must have a foot muscle Shrinkage Score of 0). – Green Light

How are decision trees applied?

SPR	Yellow
Density limit indicator (0.2 /m2)	Green
Density intermediate indicator (0.3 /m2)	**Red**
Density target indicator (0.4 /m2)	**Red**
Env / Productivity indicators	Green

How are decision trees applied?

Walk through Part A
via handouts

How are decision trees applied?

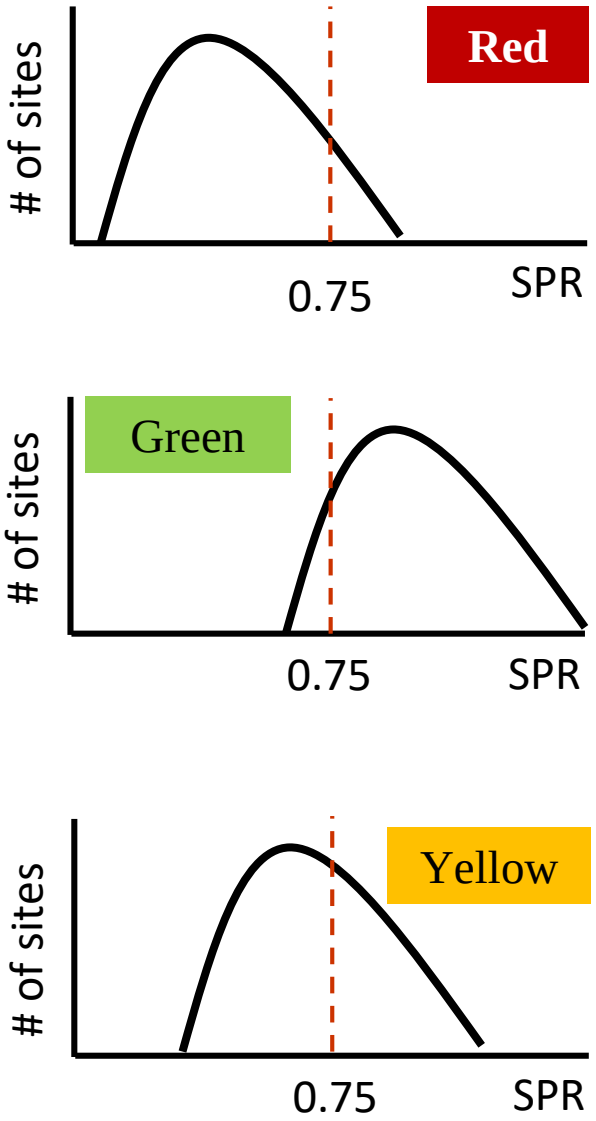
SPR	Yellow
Density limit indicator (0.2 /m2)	Green
Density intermediate indicator (0.3 /m2)	**Red**
Density target indicator (0.4 /m2)	**Red**
Env / Productivity indicators	Green

Walk through Part B
via handouts

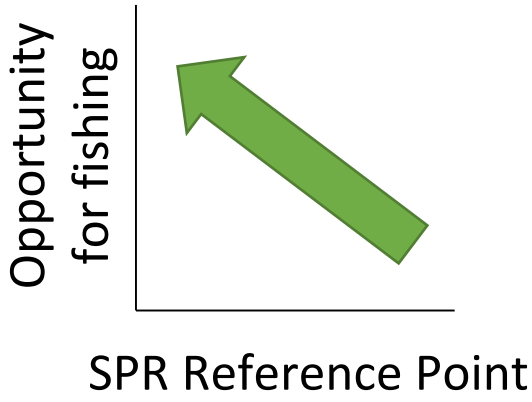
MSE to-do list

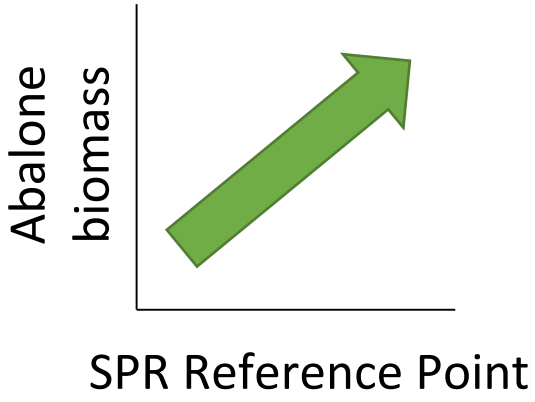
The reference point and related criteria affect opportunities for fishing and protection of abalone

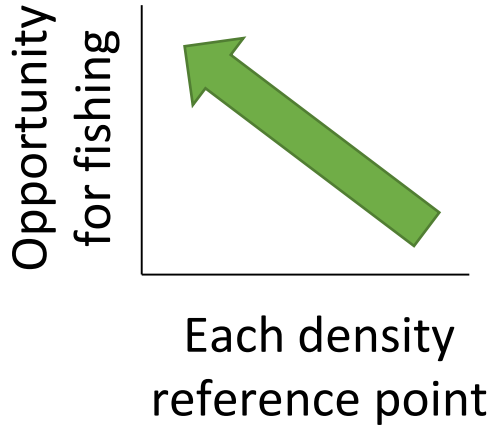
These should be evaluated with MSE to provide transparency between the above stated trade-off

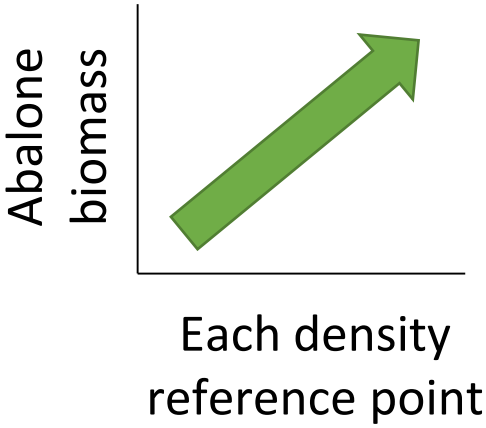


MSE to-do list









MSE to-do list

Quantify trades-offs resulting from:

- Alternative SPR target reference point and related criteria
- Alternative limit, intermediate, and target density reference points and related criteria, and confidence interval definition
- Magnitude of de minimis TAC
- Decision-interval

MSE to-do list

- The draft MS includes the following indicators: density, length-based spawning potential ratio (SPR), body condition index, ocean temperature, canopy-forming kelp abundance, and sea urchin density.

- SPR and density are the foundational indicators of the harvest control rules, and therefore MSE will focus on the performance of these two indicators in characterizing the status of the resource.

- The remaining indicators provide added insights and precaution to the decision-making process, but **may** not undergo formal performance testing, in part due to challenges in clearly defining the associated mechanistic links. This modeling team will review this issue asap.

Questions for discussion

- Is the management strategy (MS) clear and easy to follow?
- Are there aspects of the MS that should be revised?
- How should MS(s) be informed by MSE?