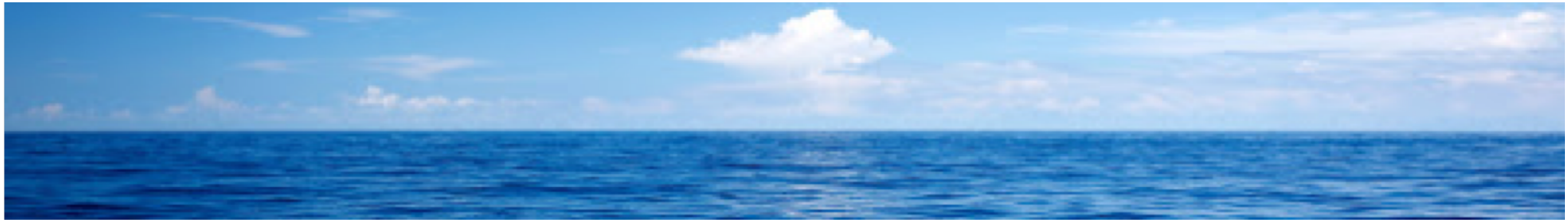


Prioritizing California's Fisheries for Management Efforts Using a Streamlined Ecological Risk Assessment

Thursday, October 3, 2019 | 1:00 PM - 3:00 PM PST

Webinar & screen sharing: https://www.uberconference.com/strategicearth

Optional call-in number: 424-228-8722, no pin needed

California Department of Fish and Wildlife (CDFW)

Presenter: Debbie Aseltine-Neilson

Today's Discussion

- Welcome & Goals
- Framework for MLMA-based Management
- Prioritization Process & Results
- Scaled Management with Socioeconomic & Climate Change Considerations
- Next Steps & Adjourn

Webinar participants are invited to ask questions and engage in a discussion following presentations

Webinar Goals

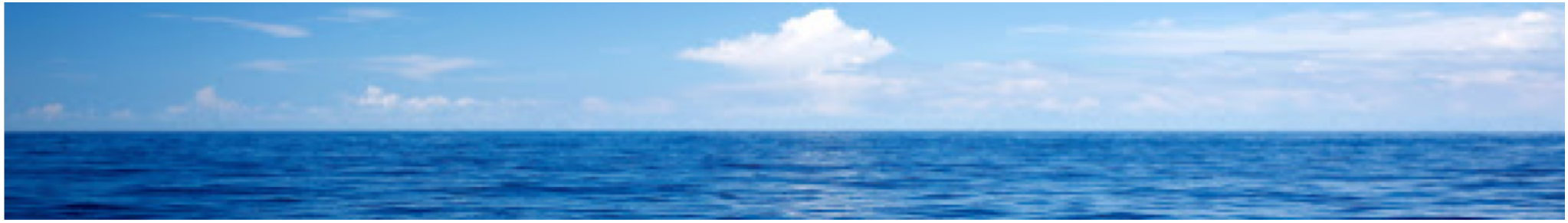
- Engage with Tribes and Tribal communities, stakeholders, and members of the public who are interested in learning about California's process for prioritizing state-managed fisheries for management efforts in accordance with the 2018 Marine Life Management Act (MLMA) Master Plan for Fisheries;

- Provide an overview of the California Department of Fish and Wildlife's (CDFW) prioritization process, including the development of a streamlined Ecological Risk Assessment (ERA) that evaluates the potential risk of fishing to the habitat and bycatch species;

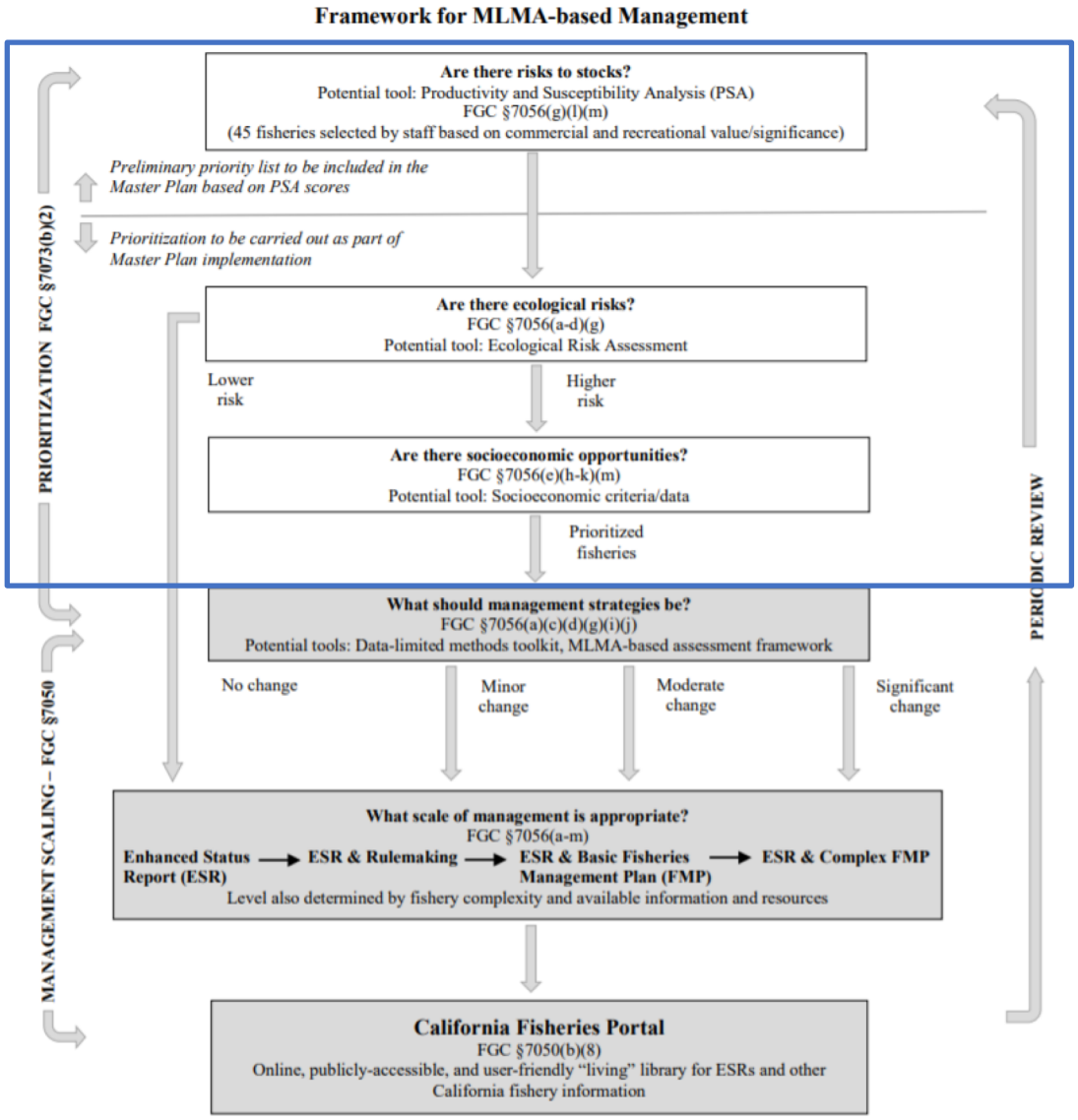
Webinar Goals, Continued

- Share an updated priority list for twenty of the state's marine finfish species and three marine invertebrate species that is the result of the ERA and Productivity-Susceptibility Analysis (PSA); and

- Orient participants to what occurs after prioritization is complete by providing an overview of scaled management, including the consideration of socioeconomic and climate change factors in management efforts.



Framework for MLMA-based Management



In progress

- Framework prioritizes and scales management effort, considering the relative risks and benefits of fisheries, and whether they meet MLMA objectives

- MLMA objectives focus on sustainability of stock, health of ecosystems, and consideration of socioeconomic opportunities to improve fisheries

Figure: 2018 Master Plan

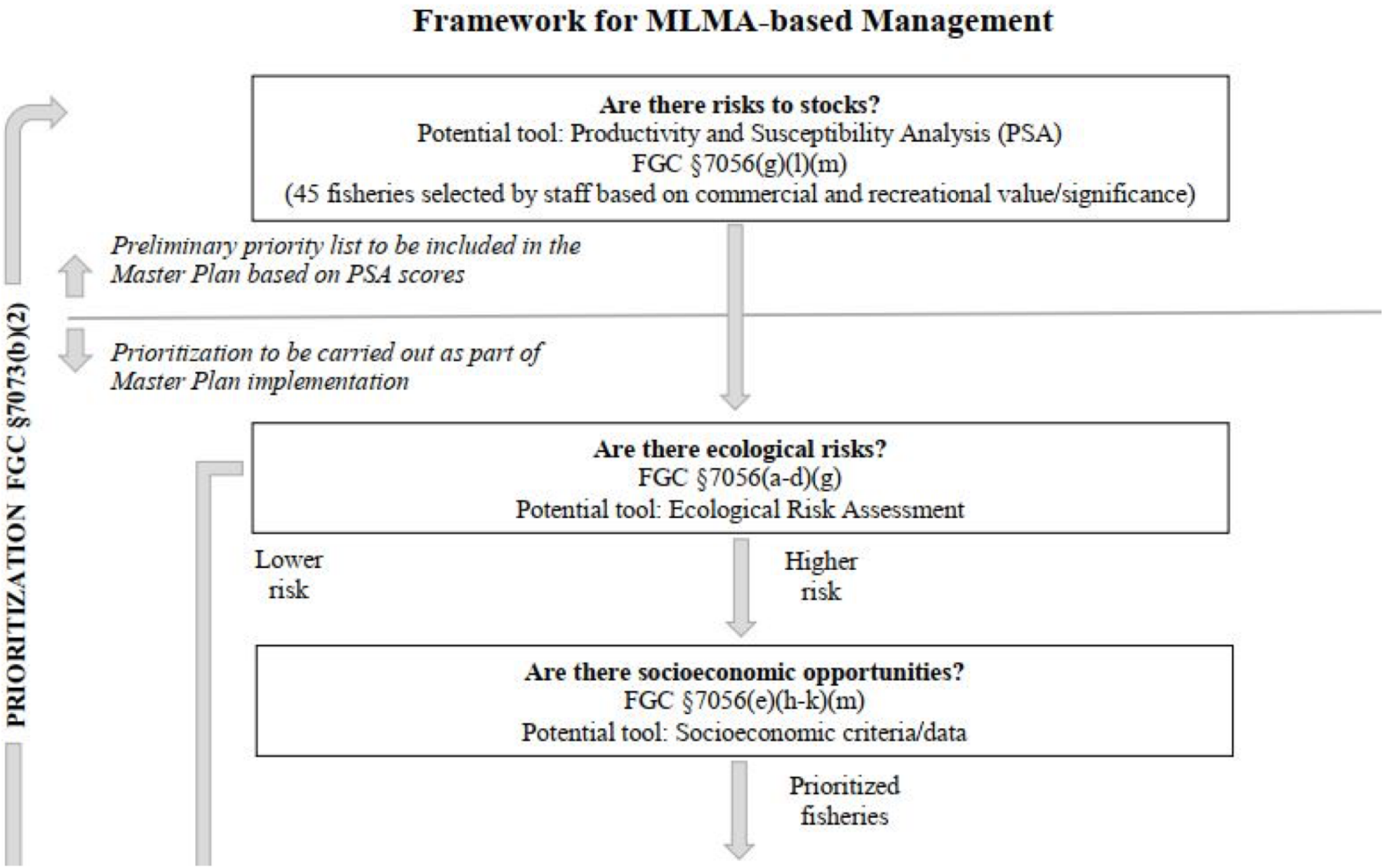


Figure: 2018 Master Plan

Tools for Implementing Prioritization

- A number of tools developed during MLMA Master Plan Amendment Process (2015-2018)
  - Information gathering projects
  - Stakeholder engagement through webinars and public meetings to refine preliminary concepts, tools, and draft 2018 Master Plan
- Shared understanding by Fish and Game Commission and CDFW that tools within the 2018 Master Plan may be optimized and new tools may be developed and implemented over time
- *Prioritization tools*
  - Productivity and Susceptibility Analysis (PSA)
  - Ecological Risk Assessment (ERA)

Questions?

- *Any clarifying questions?*

*Press ** to unmute yourself and please state your name before providing a question or comment*
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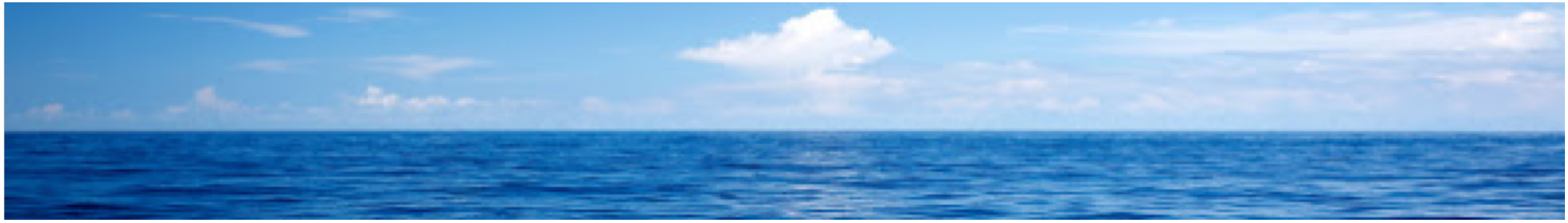

Prioritization Process & Results

Risk Assessments

- Productivity and Susceptibility Analysis (PSA)
  - Assessment of the vulnerability of a fishery species or stock using a set of predetermined measurable attributes and scoring rankings
  - Vulnerability depends on the *productivity* of a species and the *susceptibility* of the species or stock to fishing activities
- Ecological Risk Assessment (ERA)
  - Assessment of the likelihood that a fishery, species, or component of the ecosystem faces potential impacts from exposure to one or more stressors
- Risk assessment is a core component of the prioritization process that helps to identify state-managed fisheries with the greatest need for management attention

Conducting a Productivity-Susceptibility Analysis (PSA)

- Collaboration with CDFW and partners to select and apply a PSA to state-managed fisheries with greatest catch or landings (2015-2016)
  - Results shared with stakeholders during ERA workshops
- MLMA guides CDFW to consider a more comprehensive assessment of potential risk to target species, as well as evaluate risk to ecosystem
- Interim priority list in 2018 Master Plan based on PSA results only, as ERA development was not complete

Customizing an Ecological Risk Assessment (ERA) for California Fisheries

- Iterative tool development, involving partners and stakeholders
  - Draft tool shared and refined during stakeholder workshops (summer 2017) as part of Master Plan amendment process
  - Tool further refined by CDFW to be more streamlined, intuitive, and timely

- ERA framework
  - Target = impact from fishing activity to target species (impacts not captured in the PSA)
  - Bycatch = risk from fishing activity to bycatch species
  - Habitat = risk from fishing activity to habitats where fishing occurs

Conducting ERAs

- 45 state-managed fisheries
  - 21 finfish and 17 invertebrate species
- Today, ERAs completed for 32 fisheries
  - 21 finfish and 3 invertebrate species
  - ERA for White Sturgeon was completed, but not included in the prioritization process
  - Goal is to complete ERAs for all fisheries, based on CDFW capacity and available resources
- The remainder of the key invertebrate fisheries will be assessed when resources become available

ERAs: Definitions

- Fishery = species/sector/gear type
- Bycatch = any marine organism which is captured and returned to the water
- Guild = group of species with similar characteristics
- Bycatch guilds:

Sensitive	Non-sensitive (examples)
Marine mammals	Elasmobranchs
Marine birds	Pelagic fish
T/E* and special status species	Marine invertebrates

*T/E = Threatened or Endangered

ERAs: Definitions, continued

- Habitat types (examples)
  - Habitat-forming Marine Vegetation
  - Habitat-forming Marine Invertebrates
  - Nearshore Hard Bottom (0-200m)
  - Nearshore Soft Bottom (0-200m)
  - Offshore Hard Bottom (> 200m)
  - Offshore Soft Bottom (> 200m)
  - Pelagic

PSA + Target

- Four attributes were added to those of the PSA to provide a more comprehensive risk assessment for target species, as informed by stakeholder workshops and Department priorities
  - Population connectivity
  - Fishing mortality
  - Temporal intensity
  - MPA coverage
- For the resulting PSA scores, we identified natural breaks in the scores and assigned ranks based upon these natural breaks with 1 being the highest rank (highest priority) and 4 being the lowest rank (lowest priority)
- Due to changes in the bycatch and habitat assessment - which will be discussed later in the webinar- we ranked commercial and recreational fisheries separately

PSA + Target Ranking

Commercial		
Species	**Gear**	**Rank**
Pacific Angel Shark	Gill Net	1
California Sheephead	Trap	2
Spiny Lobster	Trap	2
CA Halibut	Gill Net	2
CA Halibut	Trawl	2
California Barracuda	Gill Net	3
California Bay Shrimp	Trawl	3
White Seabass	Gill Net	3
Pacific Herring	Gill Net	3
California Halibut	HL	3
Market Squid	Purse seine	4
Redtail Surfperch	HL	4
Pacific Bonito	Purse seine	4
Pacific Hagfish	Trap	4
Night Smelt	A frame	4
Jacksmelt	HL	4
Shiner Perch	Trap	4

Recreational		
Species	**Gear**	**Rank**
Brown Smoothhound Shark	HL	1
Ocean Whitefish	HL	2
Kelp Bass	HL	2
Barred Sand Bass	HL	2
Spotted Sand Bass	HL	2
California Sheephead	HL	2
Spiny Lobster	Hoop Net	3
California Barracuda	HL	3
Barred Surfperch	HL	3
CA Halibut	HL	3
White Seabass	HL	4
Pacific Bonito	HL	4
California Corbina	HL	4
White Croaker	HL	4

HL = Hook-and-Line

Bycatch

- From available bycatch information, staff identified which guilds were represented
- Initial approach considered twelve attributes
  - The attributes were scored for each qualified bycatch guild and then combined into a total score
  - Two attributes - release mortality and bycatch magnitude – were weighted more heavily
- Initial results
  - Similar fisheries often did not have similar scores
  - Some hook-and-line fisheries had higher scores than some gill net fisheries
- Review of bycatch scoring
  - Wide variation in number of guilds scored
  - Possible that input (e.g., number of guilds scored) for some fisheries was biased due to scarcity of bycatch information

Bycatch, continued

- Streamlining the bycatch approach
  - Recognize that certain gears have potential to interact with more sensitive and non-sensitive bycatch guilds
    - For streamlined approach, potential breath of sensitive and non-sensitive bycatch guilds identified for each gear type
  - In the original ERA tool, release mortality and magnitude of bycatch were given more weight than other bycatch attributes
    - In streamlined approach, used only the release mortality and magnitude of bycatch for ranking gears
  - All hook-and-line gears received same rank

Bycatch Ranking

Rank	Gear Type		Magnitude/Mortality		Magnitude/Mortality
1	Gill net - larger mesh	High	L Mag, H Mort	High	L/H Mag, H Mort
2		Intermediate	L Mag, L/H Mort	High	L/H Mag, L/H Mort
2		Intermediate	L Mag, H Mort	Intermediate	L Mag, H Mort
3	Purse seine - Market Squid	Intermediate	L Mag, L/H Mort	Low	L Mag, H Mort
3			L Mag, H Mort	High	L/H Mag, L Mort
3	Trap - CA Spiny Lobster		L Mag, H Mort		L/H Mag, L Mort
3	Gill net - Pacific Herring		L Mag, H Mort		L Mag, L Mort
4	Trap - CA Sheephead		L Mag, L Mort		L/H Mag, L Mort
4			L Mag, L Mort		L/H Mag, L Mort
4	Hoop Net - CA Spiny Lobster		L Mag, L Mort		L/H Mag, L Mort
4			L Mag, L Mort		L Mag, H Mort
4	Trap - Pacific Hagfish, Shiner Perch		L Mag, L Mort		L Mag, L Mort
4			L Mag, L Mort		L Mag, L Mort

Habitat

- Fishery experts identified the key habitats in which the fishery occurred
- If multiple habitats were scored, the expert assigned a percentage to each habitat such that the total added up to 100%
- For the initial approach, experts scored nine attributes for each identified habitat and these scores were then weighted by the habitat percentage
- Initial results
  - Some offshore pelagic fisheries had higher scores than some nearshore hook-and-line fisheries
  - Some hook-and-line fisheries over soft bottom had higher scores than some hook-and-line fisheries over hard bottom/marine vegetation

Habitat, continued

- Review of habitat scoring
  - Several factors contributed to the incongruous results, including:
    - The selection of habitats and the percentages assigned to each habitat
    - The scoring of the attributes, some of which were subjective rather than objective, resulting in different interpretations by the fishery experts
- Streamlining the habitat approach
  - Ranked each combination of gear-habitat(s) based upon knowledge of the effects of different gears on specific habitats

Habitat Ranking

Rank	Gear type	Habitat
1	Trawl	Nearshore soft
2	Gill Net	Nearshore soft
2	Trap	Nearshore hard, vegetation, inverts
2	Trap	Nearshore hard, vegetation
2	Hoop Net	Nearshore hard, vegetation, inverts
3	Trap	Nearshore soft, offshore soft
3	Hook-and-Line	Nearshore hard, vegetation, inverts
3	Hook-and-Line	Nearshore hard, vegetation
3	Hook-and-Line	Nearshore hard, nearshore soft, vegetation
4	Hook-and-Line	Nearshore soft, vegetation
4	Hook-and-Line	Nearshore soft
4	Purse Seine	Pelagic, Nearshore soft
5	Gill Net	Pelagic
5	Hook-and-Line	Pelagic
5	Purse Seine	Offshore pelagic
5	A Frame	Nearshore soft

Combining Ranks

- A PSA, Bycatch ERA, and Habitat ERA were conducted for each fishery
  - Ranks are relative and not comparable among risk assessments
- Ranks from the three risk assessments were added to attain a total number for each fishery
  - Lower number = higher rank and higher risk
  - Higher number = lower rank and lower risk
- Total numbers were not binned as these results represent a continuum
- The updated priority list should not be viewed as final.
  - Other high priority issues or concerns may take precedence.

Results: Commercial Fisheries

Species	Gear	Total	PSA Rank	Bycatch Rank	Habitat Rank
Pacific Angel Shark	GN	4	1	1	2
CA Halibut	Trawl	5	2	2	1
CA Halibut	GN	5	2	1	2
White Seabass	GN	6	3	1	2
CA Bay Shrimp	Trawl	7	3	3	1
Spiny Lobster	Trap	7	2	3	2
Pacific Herring	GN	8	3	3	2
CA Sheephead	Trap	8	2	4	2
CA Barracuda	GN	10	3	2	5
Pacific Hagfish	Trap	11	4	4	3
Shiner Perch	Trap	11	4	4	3
Market Squid	PS	11	4	3	4
CA Halibut	HL	12	3	4	5
Pacific Bonito	PS	13	4	4	5
Redtail Surfperch	HL	13	4	4	5
Night Smelt	A frame	13	4	4	5
Jacksmelt	HL	13	4	4	5

Results: Recreational Fisheries

Species	Gear	Total	PSA Rank	Bycatch Rank	Habitat Rank
Brown Smoothhound	HL	9	1	4	4
CA Sheephead	HL	9	2	4	3
Kelp Bass	HL	9	2	4	3
Ocean Whitefish	HL	9	2	4	3
Spiny Lobster	Hoop net	9	3	4	2
Spotted Sand Bass	HL	10	2	4	4
Barred Sand Bass	HL	10	2	4	4
CA Halibut	HL	11	3	4	4
Barred Surfperch	HL	11	3	4	4
White Seabass	HL	12	4	4	4
CA Barracuda	HL	12	3	4	5
CA Corbina	HL	12	4	4	4
White Croaker	HL	12	4	4	4
Pacific Bonito	HL	13	4	4	5

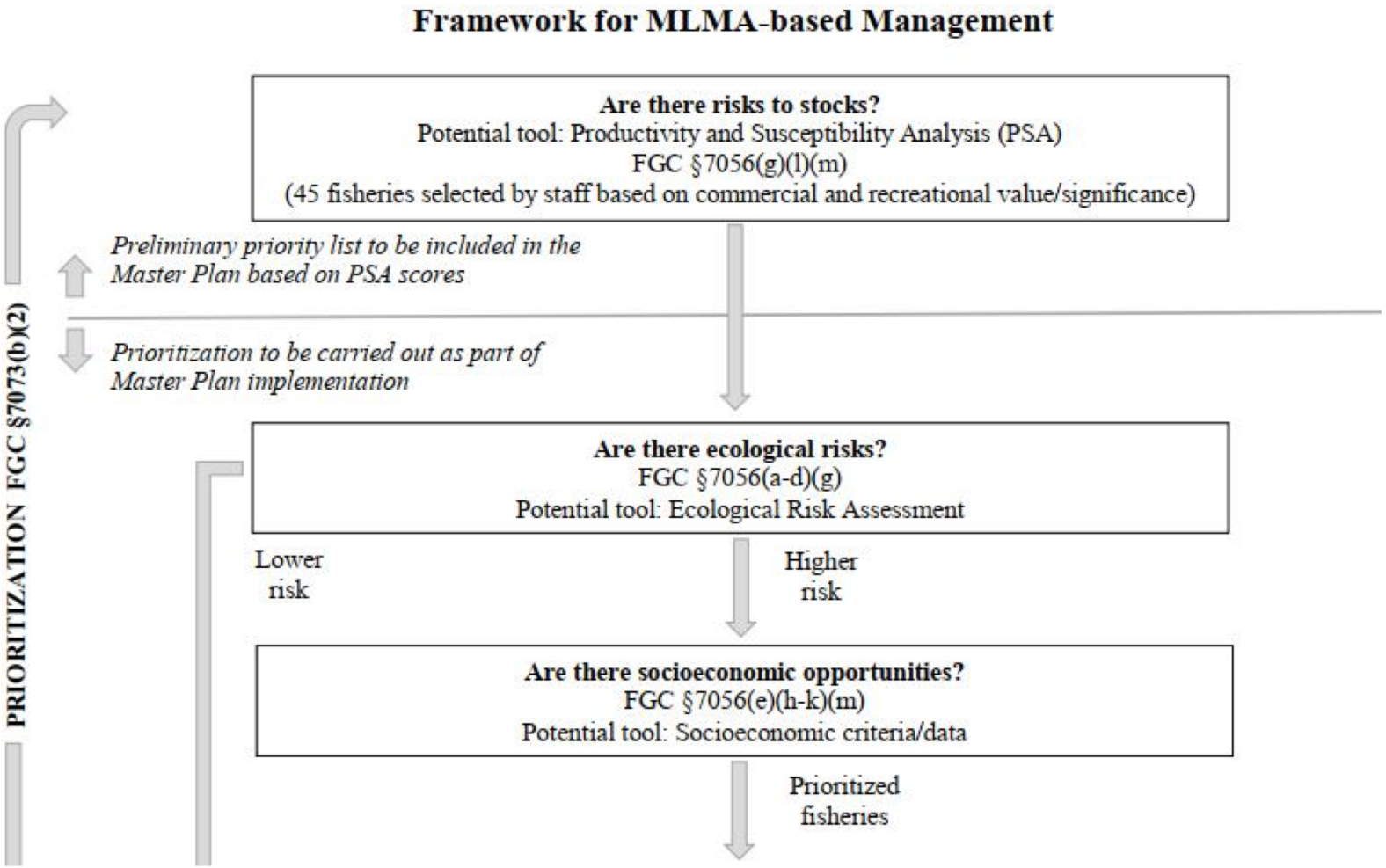

Figure: 2018 Master Plan

Questions & Discussion

- *Do you have a better understanding of how the prioritization process fits into the MLMA-based management framework as provided in the 2018 Master Plan?*
- *Do you have any questions regarding the streamlined ERA approach or results?*

*Press ** to unmute yourself and please state your name before providing a question or comment*

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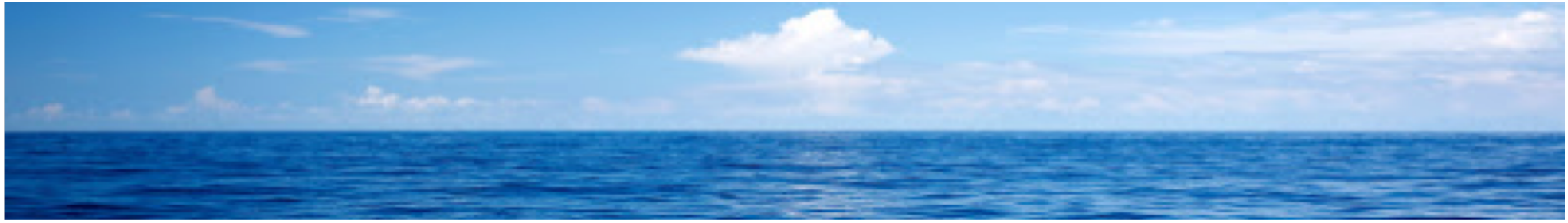


Scaled Management with Socioeconomic & Climate Change Considerations

From Prioritization to Scaled Management

I. MLMA Framework - Prioritization		
Tasks	**Partners**	**Time Frame**
Fisheries Set #1: Key finfish plus Bay Shrimp, CA Spiny Lobster, and Market Squid		
• Conduct Bycatch Ecological Risk Assessment (ERA) and Habitat ERA; conduct Target ERA and combine with Productivity & Susceptibility Analysis (PSA); combine bycatch, habitat, and target results		PC July 2019
• Present update on production of prioritized list for Fisheries Set #1 to MRC		July 2019
• Apply socioeconomic and climate considerations	CA Sea Grant	PC Aug 2019
• Engage stakeholders: ERA + PSA prioritization results; socioeconomic and climate considerations; next steps (scaling)	Engagement opportunity for CA Tribes and interested stakeholders	PC July - Sep 2019
• Present prioritized list for Fisheries Set #1 to FGC		Presentation at Oct FGC meeting; final approval at Dec FGC meeting
II. MLMA Framework - Scaling		
Tasks	**Partners**	**Time Frame**
High-Rank Fisheries (Set #1): conduct evaluation (degree of management change needed; fishery complexity) to determine appropriate management scale	Specific engagement opportunities for CA Tribes and interested stakeholders will be added to the Work Plan as they are identified	PC Feb 2020

Table: CDFW Work Plan for 2018 Master Plan implementation – June 2019

- Streamlining prioritization process approach pushed back original time frame
- During this last quarter of 2019, we will be presenting the updated results to the Fish and Game Commission
- Management scaling process will be conducted next with results expected in early 2020

Scaled Management

- Scaled management addresses the questions:
  - What happens next for fisheries that have been identified as higher priority?
  - What is the appropriate management action?

- Scaled management seeks to match the level of management effort with the management needs and complexity of the fishery

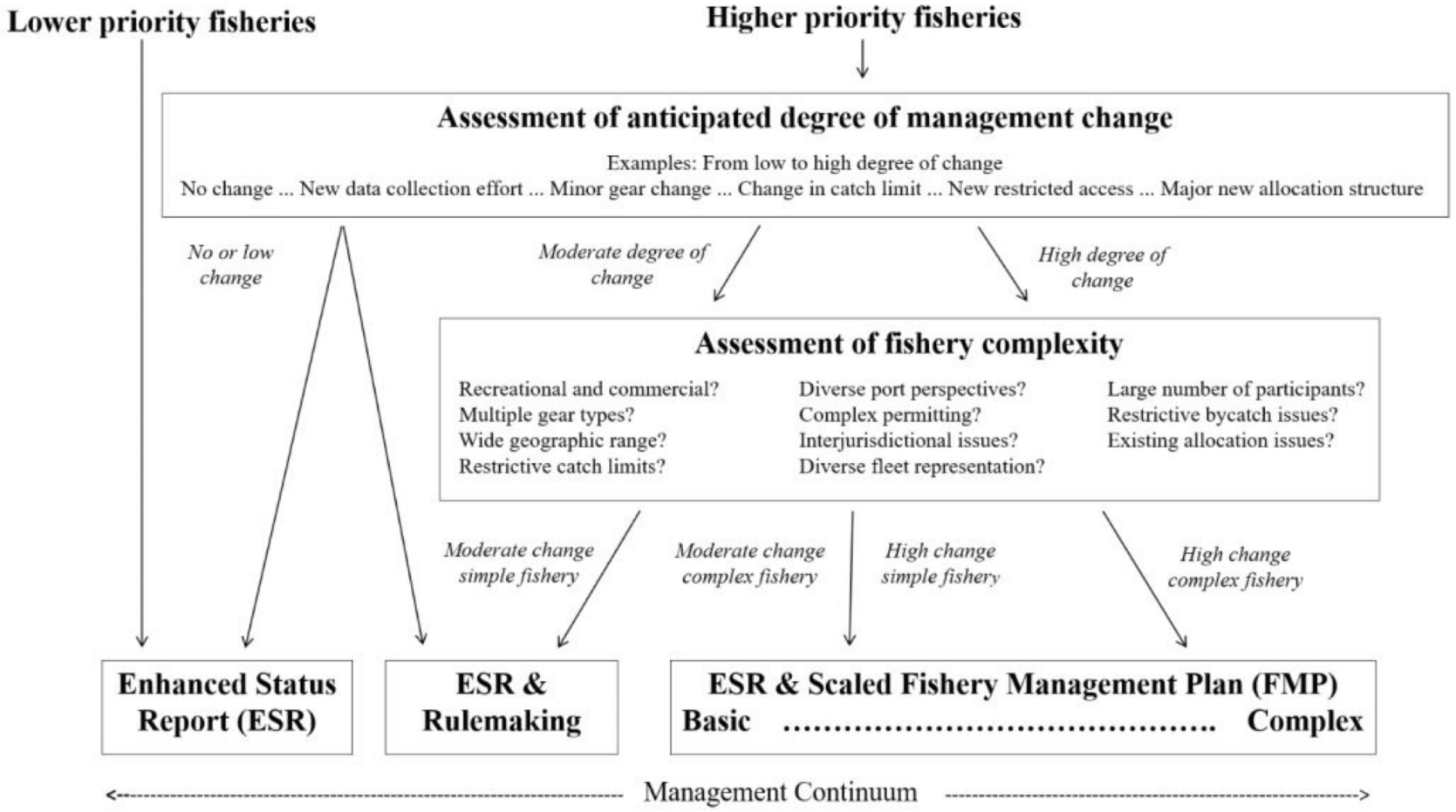


Figure 3. Identifying where a fishery falls along the management continuum.

Scaled Management: Considerations

- Incorporating socioeconomic and climate change considerations into this process
  - Socioeconomics important both in evaluating the degree of management change needed and the complexity of the fishery

- Scaled management also takes into consideration:
  - The availability of information useful for management;
  - Results from the PSA and ERA;
  - Available stock assessments;
  - Tools such as the Data-Limited Management Tool;
  - CDFW's available resources; and
  - Interests of stakeholders and the Fish and Game Commission

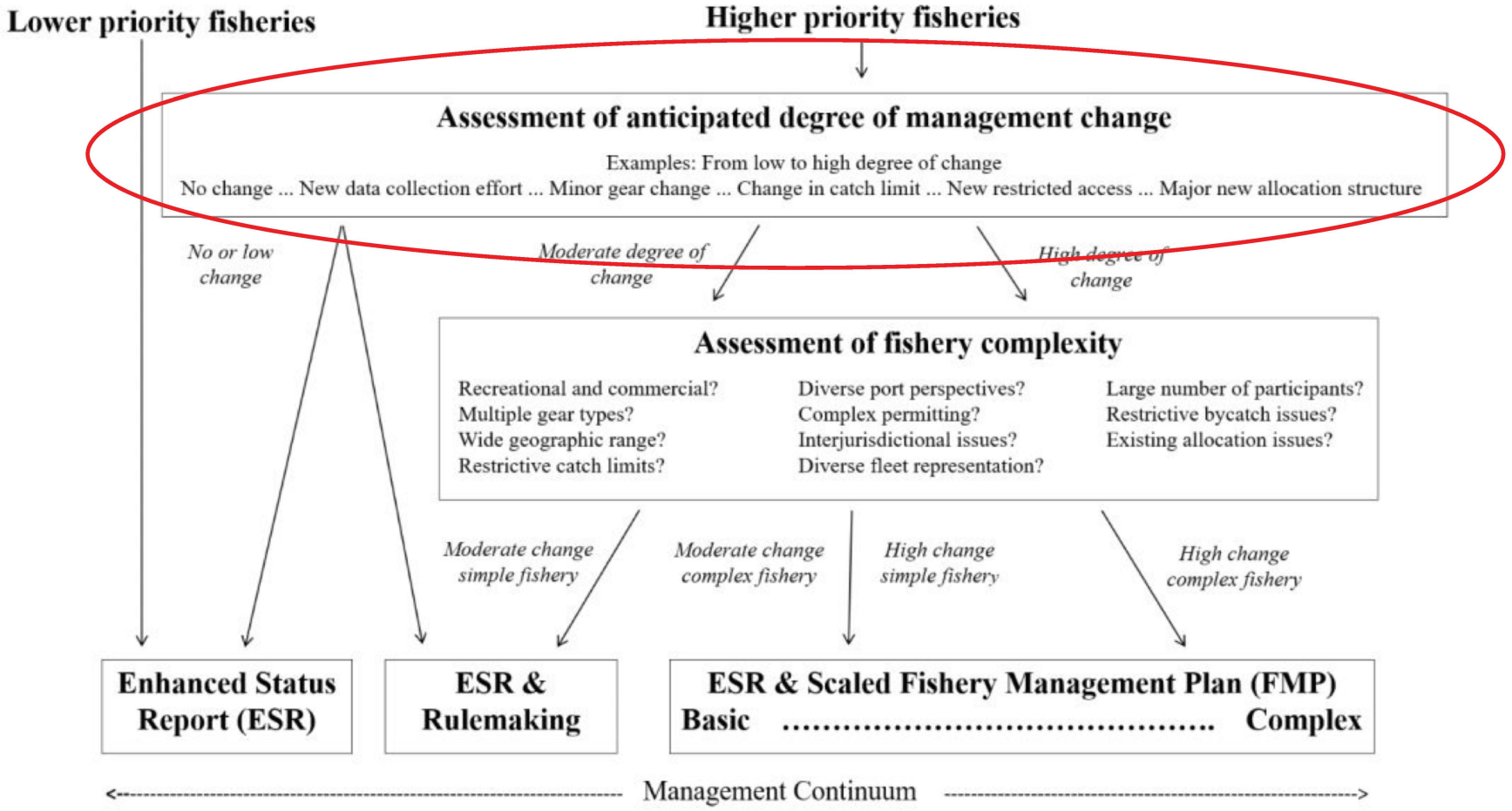


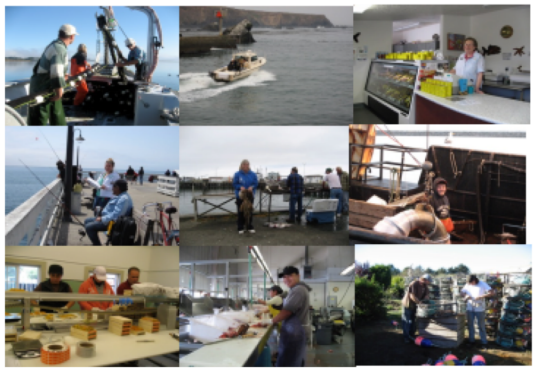
Figure 3. Identifying where a fishery falls along the management continuum.

Incorporating Socioeconomic Considerations

Effective fisheries management requires attention to and integration of the “four pillars of sustainability” — the social (including cultural), economic, and institutional aspects (the ‘human dimension’) as well as the biological aspects.

Stephenson et al. (2017)

SOCIOECONOMIC GUIDANCE FOR IMPLEMENTING THE CALIFORNIA MARINE LIFE MANAGEMENT ACT



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OCTOBER 2018

Socioeconomic Challenges & Opportunities

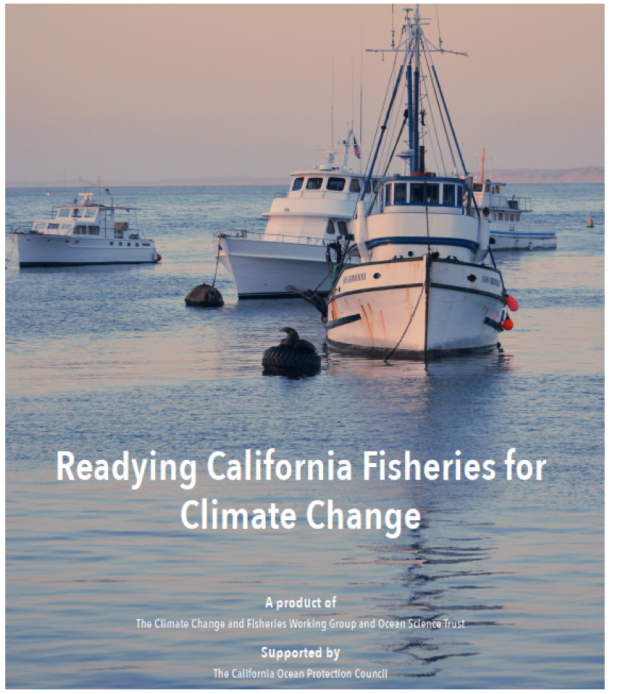
- Based upon MLMA objectives, socioeconomic considerations can be divided into several themes.

- For each of the socioeconomic themes, we can ask:
  - Are there challenges and opportunities?
  - Are these important, and if so, are they urgent?
  - What is the degree of management change needed to address these?

- Effort, for example, is one of these themes. If there has been a notable change in effort (participants, operations, fishery practices, practices among fisheries), then are there associated challenges and/or opportunities that management should address?

Incorporating Climate Change Considerations

- Globally, on average, ocean temperatures are increasing, ocean waters are becoming more acidic, and the sea level is rising
- Oceanographic conditions off California are quite variable
- Readying CA Fisheries for Climate Change
  - Four scenarios:
    - Historical variability
    - Increased variability
    - Range shifts
    - Crossing thresholds



Chavez et al 2017. Readying CA Fisheries for Climate Change. CA Ocean Science Trust

Incorporating Climate Change Considerations

- Consider responses of target species, fisheries, and management to past events:
  - Regime shifts (e.g., Pacific Decadal Oscillation)
  - Recent El Niño and La Niña events
  - Heat wave event of 2014-2016 (e.g., the “blob”)

- Then can use this information to consider how target species and fisheries might respond to future oceanographic conditions under various scenarios, and ultimately to consider what degree of management change might be needed

Questions & Discussion

- *Do you have a better understanding of how scaled management works?*
- *Do you see value in considering socioeconomic and climate change as part of the scaled management process?*

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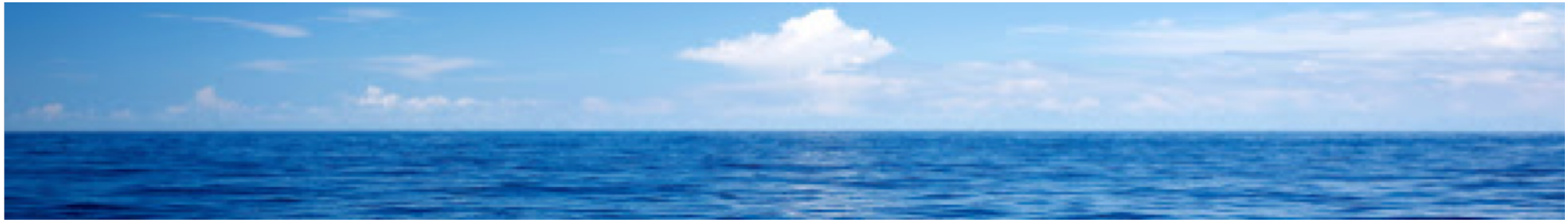
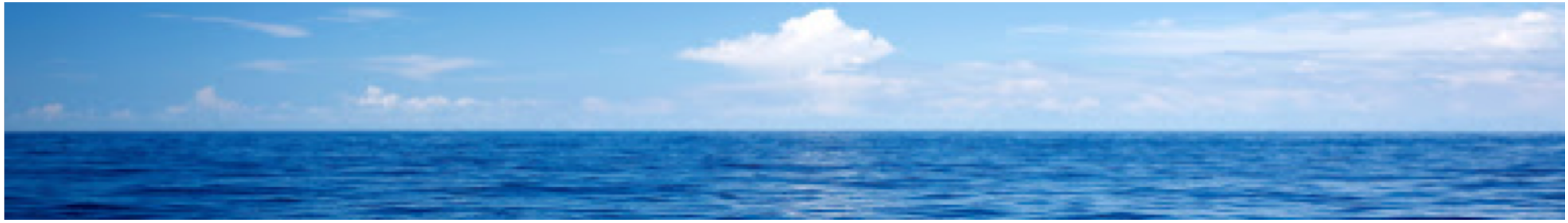


Next Steps & Adjourn

Next Steps & Timeline

- Summary of webinar key themes, discussions, and next steps
- Share, review, and discuss updated fisheries priority list with Fish and Game Commission and Marine Resources Committee (MRC), fall/winter 2019
  - Informational updates at Commission/MRC public meetings
- Scaled management, early 2020



Thank You!

For more information (including access to webinar materials), please visit:
CDFW Marine Management News at https://cdfwmarine.wordpress.com/

Questions or additional information about the prioritization process?
Contact Debbie Aseltine-Neilson at Debbie.Aseltine-Neilson@wildlife.ca.gov