

## **Workshop Summary**

### **‘Advancing CPS Management Strategy Evaluation (MSE) in the California Current’**

**Southwest Fisheries Science Center (SWFSC), La Jolla, CA**

**9<sup>th</sup> October 2018**

#### **Workshop participants:**

Desiree Tommasi (SWFSC), James Smith (SWFSC), Caitlin Allen Akselrud (UW), Dale Sweetnam (SWFSC), Albert Carter (Ocean Gold Seafood), Diane Pleschner-Steele (California Wetfish Producers), Corey Ridings (Ocean Conservancy), Mike Conroy (West Coast Fisheries Consultants), Theresa Labriola (Wild Oceans), Steven Stohs (SWFSC), Jonathan Sweeney (SWFSC), James Hilger (SWFSC), Gillian Lyons (PEW), Katherine Grady (CDFW), Kirk Lynn (CDFW), Briana Brady (CDFW), Travis Buck (CDFW), Cyreis Schmitt (ODFW), Joshua Lindsay (NMFS), Barbara Muhling (SWFSC), Kevin Hill (SWFSC), Paul Crone (SWFSC), Emmanis Dorval (SWFSC), Noelle Bowlin (SWFSC), Andrew Thompson (SWFSC), Ed Weber (SWFSC), Kevin Ray (SWFSC/UCSD)

#### **Workshop objectives:**

This workshop was aimed at engaging stakeholders in the coastal pelagic species (CPS) fishery to advance development of CPS management strategy evaluation (MSE) in the region, with an outlook to better understand how climate change will affect CPS fisheries. A key goal was to discuss priorities and concerns in the CPS fishery, which inform the MSE process by indicating appropriate management strategies and fishery performance metrics. This workshop was organized by researchers from the SWFSC (the ‘Future Seas’ and ‘Coastal SEES’ projects) and the University of Washington. The agenda used in this meeting is attached to this document.

#### **Key points identified by NOAA and UW researchers:**

- **CPS**
  - The CPS industry wants stability and flexibility; this means having as much warning as possible about future change to benefit a range of industry decision making; and the regulatory flexibility to respond to changes
  - Some ports/communities more vulnerable to change than others. This vulnerability, as well as the demographics of the fleet (including fisher entry and exit), are important socio-economic factors we will attempt to consider
  - Northwest and Southwest CPS fisheries are different (in terms of the composition of the catch, the portfolio of the fishers, regulations, and weather) and we will incorporate this detail wherever possible

- Market order is very important in determining what is targeted and when in the CPS fishery; the relationship between fisher and port/processor is well developed, and a processor is typically arranged before fishing occurs
- There was interest in considering the CPS *assemblage*, in terms of a single CPS permit and a multi-species quota, although there were doubts as to whether such management changes would benefit the fishery
- Spoilage of CPS is rapid, so vessels remain as close to a port as possible and usually return within one day; there could be large impacts if CPS move into areas where there is no nearby infrastructure to land catches
- There is little clear evidence of a shift in the distribution of CPS, although squid may be appearing in the north more often. This highlights the value of using mechanistic models for CPS distribution and movement (rather than simply statistical models)
- CPS are key ecosystem species, and it's important to maintain diversity in where CPS is available in both the ecological and economic systems; and shifts in distribution may alter important ecosystem linkages
- **Sardine**
  - There was considerable interest in the sardine stocks (northern and southern) in terms of how they are determined and assessed, and how shifts in these stocks might influence the sardine fishery
  - There was comment on the accuracy of the assessment, specifically with respect to how the existing survey includes near-shore fish
  - There was discussion of the current seasonal allocation of the sardine quota, and how this has advantages and disadvantages; there may be value in an MSE examining how future seasonal allocation will influence quota access between the NW and SW
  - A good understanding of larval retention and currents are key to sardine dynamics, not just suitable sea-surface temperatures, and we hope to address this using an existing individual-based model (IBM)
- **Squid**
  - There was a discussion of the 'escapement' rule used in squid management, and a general agreement that the current weekend closures and marine reserves are likely sufficient to allow for the target 30% escapement
  - There is industry interest in the development of the squid fishery in the Northwest, so it is valuable to figure out squid distribution and stock information.
  - Caitlin Allen Akselrud may explore, as part of her research, escapement and max catch management rules

## **Meeting Summary:**

### **MORNING I:**

Attendees were welcomed, and slides were presented by Desiree outlining: the research participants, the Future Seas project's progress since the earlier stakeholder meeting in March 2018, the objectives of this meeting, the Futures Seas project (summarizing the biology and

management of sardine and other CPS, some of the tools that can contribute to a CPS MSE), and the biology and management of market squid (presented by Caitlin).

The morning's discussion was focused mostly on squid, and some of the key discussion points were:

- Squid and its management. The federal OFL is based on an escapement rule (estimated by NMFS post-season, and the 188K ton cap is a state regulation. There was comments that the 118K ton cap is sometimes reached; and that appropriate squid escapement may occur largely due to area and weekend closures. Oregon fishery for squid may be developing, and ODFW get industry inquiries about the future of squid in Oregon, so it's important to know where the Oregon squid come from. Sources of squid data that will be targeted: CalCOFI, rockfish survey, some Washington-Oregon surveys, a salmon survey, CPS coast-wide survey, and commercial catch data.
- What is the purpose of the squid modelling/stock assessment given that the species is so short-lived, with fast dynamics and patchy distribution? Noted that most CPS surveys occur relatively offshore and squid spawn typically inshore. 'Stock assessment' requires an abundance index, and this may be challenging given squid's biology.
- How will management strategies be selected? We will first test the existing management strategy, and examine its performance and uncertainties into the future. Then use stakeholder meetings such as this to identify climate-related management strategies of interest, perhaps related to HCRs.

## MORNING II:

Desiree presented slides describing the MSE process (with examples), and describing the general structure of the Future Seas project and its approach to climate-informed MSE. Presented questions to guide the general management discussion, including "What do you want from your CPS fishery?"

This part of the discussion was a general one of the CPS fishery, and some of the key discussion points were:

- How is the proposed MSE different to Andre Punt's sardine MSE? The Future Seas MSEs will differ from Andre's by looking specifically at climate. They will test different management strategies, and be of a different model structure.
- Asks about the southern sardine stock, as this can extend quite far into California. We will certainly model the 'temperature rule' that is currently used to apportion the catch to both stocks, and test how well that rule continues to work in the future, but beyond that we may have insufficient information.
- Sardine Allocation: Current coast-wide allocation of sardine quota has an advantage of allowing flexible fishing given a variable spatial distribution of sardine, but it can have a disadvantage of having the quota reached before sardine return to California from Oregon later in the season.

- What do you want from your sardine fishery? Would like to know what changes are coming, with as much warning as possible, to benefit a range of industry decision making. To encourage more stability. Even a few year's notice would be valuable, alongside long-term trends, even qualitative trends such as 'upward' or 'downward' trend. Processors and fishers really do want to know what's coming up. As much info as possible about which species and how much of each species. Notes the value of forewarning about which species/fisheries will be available, especially for some communities, so that they can plan better to fish more consistently. For processors, they can struggle to respond quickly to changes due to the time it takes to find and train employees. Future Seas will attempt to address this by looking at community vulnerability indices and port-level information.
- The sardine assessment may be inaccurate due to surveys may be missing inshore sardine.
- The NW is a seasonal CPS fishery, due to the abundance of fish but also safety/weather concerns. NW CPS fishery can be very susceptible to closures due to seasonal nature of the fishery, and the HCR rules can cause a closure before the NW has had much time to harvest. Notes that the Southern and NW areas have very different fishing communities due to the fish species in the fishery as well as their flexibility for fishing. The fishing infrastructure can really suffer from idle periods.
- There was interest in whether a merged (i.e. single) CPS permit has benefits. It was noted that a single CPS coast-wide permit might make sense for CPS finfish, but may be more complicated for squid.
- Some industry uncertainties: fossil fuel availability and price; next generation of fishers (and opportunities like quota banks); trained employees; maintaining diversity in the CPS assemblage for the ecosystem and predators as well; the movement of sardine into certain NW areas without nearby processors could be an issue for their harvest.
- The modelling in the Future Seas project is restricted to CPS, and some of this discussion is clearly of the broader ecosystem and beyond our scope. But we can contribute to the decision making the industry might make related to CPS, even if it's only part of the information they need to make climate-informed decisions.

After LUNCH:

Jonathan presented slides outlining our approach to fleet dynamics, and goal of developing an agent-based model. Presented questions slides on fishing decisions.

This part of the discussion was devoted to some of the decision making that goes on to determine fishing locations and target species of the CPS fleet, and some of the key discussion points were:

- The decisions of where and when to fish and what to target can depend on whether the vessel is 'owner-operated' or 'company-owned'. The owner-operator vessels have more agency to decide what and when. CPS vessels (sardine and anchovy, and to a lesser extent squid), are largely limited to staying out for 1 day. Regardless of vessel ownership, much of the CPS fishing is driven by market order. The boats will have a port and

processor lined up before they go fishing. The relationship between the markets and fishers is important. Coastal tunas are important to the catch and income for CPS boats. For the NW fleet, most vessels leave from Astoria, but can land elsewhere. They can hire a pilot to look for fish, and the WA and OR fleet will use this information to decide where to fish, before returning to their arranged port. Spotter planes are frequently used.

- Key ports for CPS landings are: San Pedro, Ventura, Morro Bay, Monterey, Half Moon Bay, and San Francisco. Important to know if some smaller ports, such as Astoria, can remain viable. Most plants in OR are permanent, but temporary landings can be set up, particularly for squid, with trucks taking landings to regular plants.
- A seine boat needs options, so OR boats often have CA permits, or they could switch gears. They try to be very flexible. Historically, NW fishing can stop due to weather, and in the SW more likely due to allocation and quota.
- Price and market order drive what is targeted. Prices can also vary by port, for example anchovy is worth more at Monterey. What are the key forces driving price? There are different markets for different species, so it's complex. International markets and their supply and demand are important for price. Building the domestic market is hard, lots still exported. Tariffs are having a bit of an impact.

#### AFTERNOON:

Desiree presented slides on climate change in the California Current, including information on projections for basic environmental drivers (such as sea surface temperature), the 2014-16 'Blob' event and some of its impacts, and the underway California Current Fish Climate Vulnerability Assessment which includes an evaluation of CPS.

This part of the discussion was devoted to observed and possible climate effects on CPS, and some of the key discussion points were:

- Sardine stocks. A shift in adult habitat doesn't always mean success due to the importance of larval habitat and retention of larvae. And the stocks are not well defined. The temperature rule in the stock assessment used to split stocks has huge assumptions. E.g. one vessel fishing 13.9°C water, and one fishing 14°C water can't realistically be expected to be fishing completely different stocks.
- Squid habitat and changes. Squid distribution changing possibly in the NW, but in SW squid exist in the same places. Squid fishing grounds have stayed about the same. Availability of sandy squid spawning habitat may limit the northward expansion of squid. But also anecdotal evidence of squid spawning more on rocky habitat. Squid seem resilient to El Nino, but can move to cooler and deeper waters and be harder to catch.
- Emerging CPS fisheries? Agreed that there were realistically none.
- Is fleet location fairly fixed? Most facilities are fixed. A mobile processing ship could allow for some flexibility though. CA has invested in portable pumps which creates a more flexible offloading situation. But there is a limit to how far its profitable to truck fish. Between Coos Bay and San Francisco there is very little opportunity for large

volume (squid) landings. If the squid biomass shifted north 200-300 miles, a lack of infrastructure could mean that squid goes unharvested.

- Sea-level rise is a long-term concern for some.
- Are there more days fishable for the CPS fleet in the SW than NW? Yes. Weather is a big issue, and can close access to some ports. 20 knots used to be a limit above which you wouldn't fish, but high prices can mean people take risks and fish anyway. In the NW, the worst weather is Nov-Dec to March. Weather also hampers spotter plane flights.
- Changes in spawning habitat and phenology could be large, but do we have the ability/surveys to detect this? Can we create information to help inform surveys?

## WORKSHOP AGENDA

# Advancing CPS MSE Development in the California Current

*This workshop is organized by the Future Seas Project and the University of Washington and will be convened by the National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center. The workshop aims to engage stakeholders in the CPS fishery to advance development of a CPS MSE for the region and to understand how climate change will affect CPS fishery performance and management. The workshop also aims to identify specific climate vulnerabilities in the fishery and potential mitigation strategies.*

Date:

October 9, 2018

Location:

Pacific Room, SWFSC

8901 La Jolla Shores Drive, La Jolla, CA 92037

9:00am Welcome, opening remarks, and introductions.

9:30am Introduction to Future Seas and other projects contributing to CPS Management Strategy Evaluation in the California Current.

10:30am Coffee break

11:00am Discussion of CPS Management Objectives, Performance metrics and Concerns

- Overview of current management.
- What would your ideal CPS fishery and regulatory landscape look like?
- How would you know if your goals are being achieved?
- Synthesis of priorities and concerns and how these translate into management objectives and performance metrics

12:30pm Lunch

1:30pm Dynamics of CPS Fishing Activity

- What factors determine when, where, and how long you fish?
- How do you decide to switch targets?
- What factors limit switching?
- When do you move instead of switching?

2:30pm Coffee Break

3:00pm Climate Change Outlook

- Perceptions of climate impacts, and fishery outlook
- Identification of climate vulnerabilities
- Come up with a list of potential mitigation strategies (What ways can you address these vulnerabilities?)

4:00 – Review of workshop output and closing remarks