



Marine
Resources

Exhibit E

Commercial Market Squid

Oregon Fish and Wildlife Commission

February 18, 2022

Troy Buell, Marine Resources Program

Photo by Heather Van Meter, OSP



Outline

Background

- Biology and ecology
- Fishery and management

Regulatory Recommendations

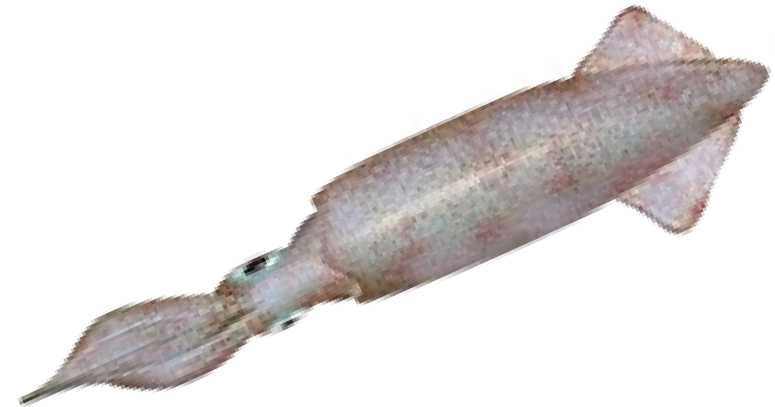
- Limited Entry Control Date
- Net specifications

Informational Report

- Vessel monitoring system
- Weekly closures
- Ecosystem considerations

Looking Forward

Staff Recommendation Summary



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<https://commons.wikimedia.org/w/index.php?curid=22537248>



Biology and Ecology

Single species – *Doryteuthis (Loligo) opalescens*

Short lived – less than 1 year, average age at harvest is 6 months in California

Terminal spawners

- Spawning occurs at end of lifespan
- Females may spawn multiple times during single spawning event

Shallow water mating/spawning aggregations

- Concentrated in spring and fall off Oregon

Eggs deposited on sandy bottom

Hatch in 3-8 weeks

Move to deeper water off continental shelf as they grow and mature

Market squid egg cases

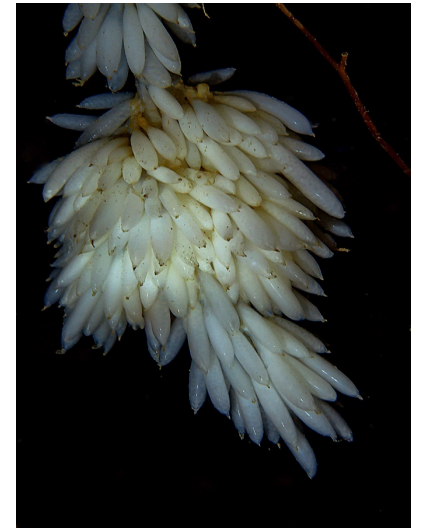


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Climate and Ocean Change

Part of forage base for many species of fish, marine mammals, and seabirds

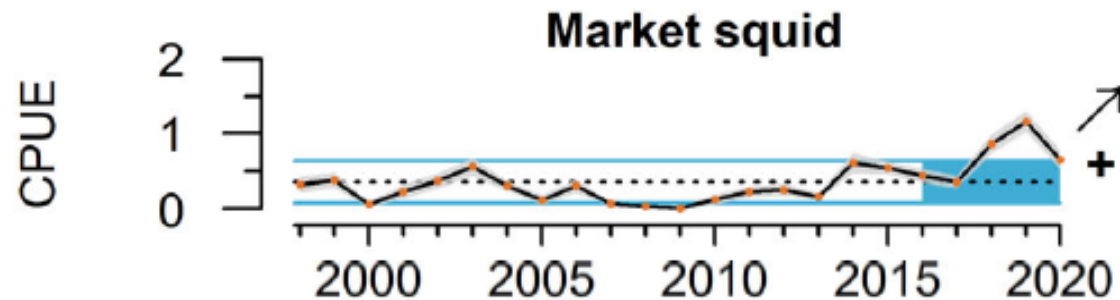
- No known market squid specialists

“Boom and bust” population cycles

Affected by El Nino/La Nina

- More productive in northern areas during El Nino

Recent increase off Oregon related to Marine Heat Wave (Chasco et al 2022)



Standardized market squid catch from NOAA Fisheries Juvenile Salmon Ocean Ecology Survey

Figure adapted from PFMC Integrated Ecosystem Report 2, March 2021, figure G.1.1. CPUE (log10(no/km+1)) for 8 taxa in the Northern California Current Ecosystem, 1998-2000.



Commercial Fishery

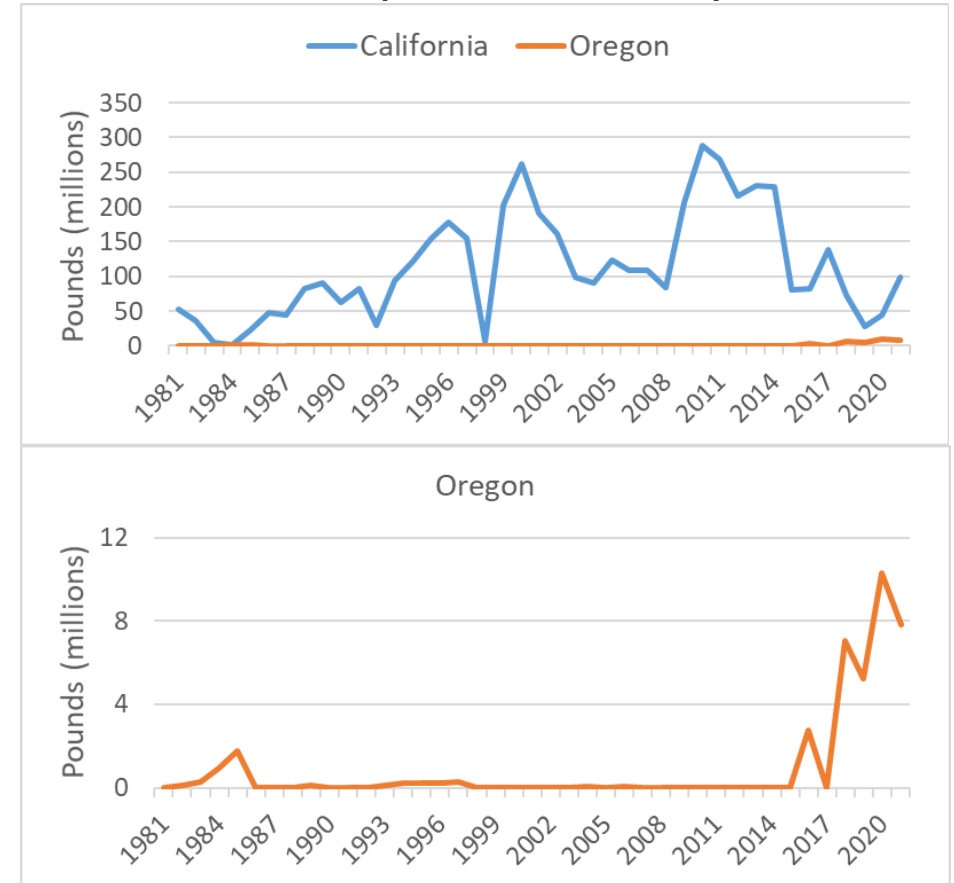
California

- Long, consistent history
- Highly developed industry and infrastructure
- Robust fishery management
 - Restricted participation
 - Annual harvest cap
 - Weekly closures
 - Area closures
 - Considers ecological and social dimensions

Oregon

- Short, sporadic history
- Developing local industry and infrastructure
- Little management until recently

Market Squid Landed By Year



Fishing Gear

Purse seine

- Includes lampara, other encircling nets
- Vast majority of Oregon landings

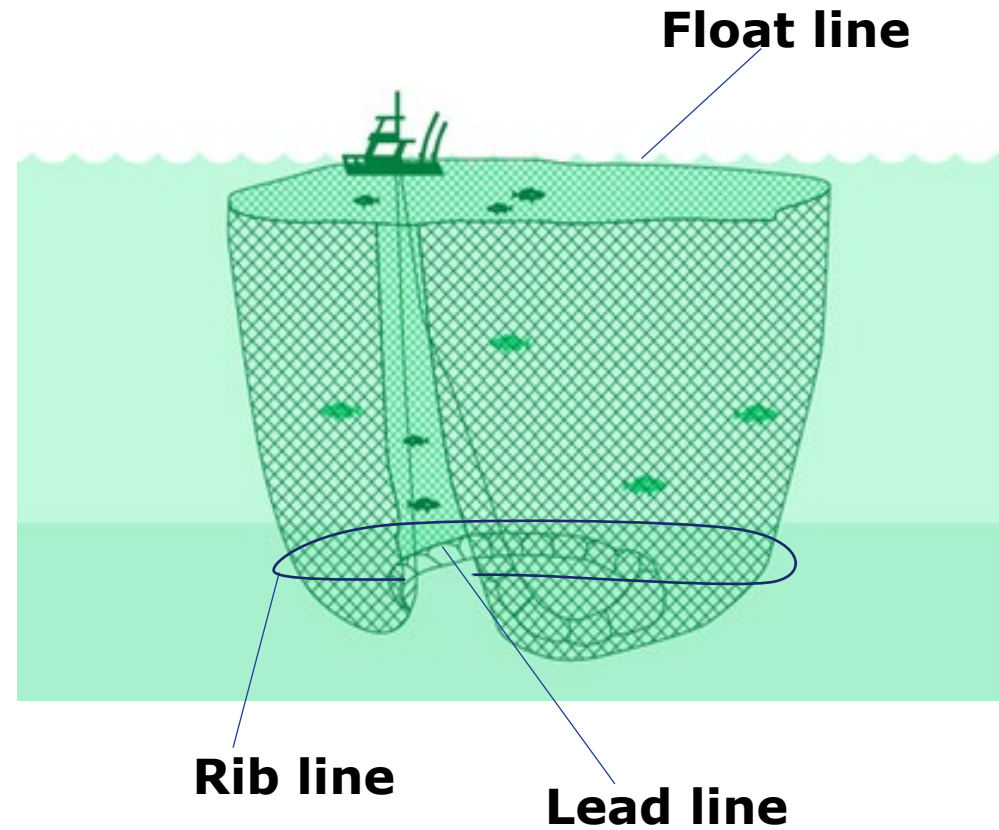
Light boats

Trawl

- State waters only (inside 3 miles)

Brail/dipnet

Hook & line



Current Oregon Fishery Management

- Open access with commercial licenses
- Harvest Guideline
- Two day per week closure
- Closed areas
- Gear regulations
- No reduction fishery
- Logbook
- Bycatch limits (sardine, smelt)
- Prohibited species, handling requirements



Frequently Asked Questions Commercial Market Squid

April 7, 2020

Attachment 4

Marine Resources Program
Oregon Department of Fish and Wildlife
2040 SE Marine Science Drive
Newport, OR 97365
www.dfw.state.or.us/MRP

What's required to fish for market squid off Oregon?

- To fish in state waters (inside 3 nautical miles) or to land squid in the state, Oregon commercial licenses, including for the boat, skipper and crew, are required for:
 - Any vessel fishing for squid, excluding a skiff used with purse seine gear.
 - Any vessel participating in the fishery by "lighting" for squid.
- The skipper must complete and submit a logbook, according to the instructions in the logbook. A seine logbook is required for vessels using purse seine, lampara net, brailing, or scooping.
- A commercial vessel may pump market squid onboard directly from the pursed seine of another vessel provided these squid make up no more than 20% of each landing of the receiving vessel, and the vessel receiving squid:
 - Has fished purse seine gear during the current year and pumped resultant catch onboard the same vessel for delivery in Oregon; and
 - Has legal seine gear onboard, in good working order; and
 - Documents the vessel that made the set, any other vessel pumping squid from the pursed seine, and documents catch and location in the ODFW logbook.
- No more than 10% of a squid landing may go toward reduction (e.g., fish meal, fertilizer, etc.)

What are legal fishing gears for squid?

- Legal gears include purse seine, lampara net, brail net, dip net, cast net, & hook and line.
- It is legal to use lights as an attractant for commercial squid fishing. Lights may be operated from a vessel that is independent of the catching vessel, but commercial licenses are required for the light boat, skipper and crew.
- In state waters (inside 3 nautical miles) trawl gear, such as shrimp trawl, is also legal. In federal waters (outside of 3 nautical miles) trawl gear is not legal. Market squid taken as bycatch in federal waters in shrimp or groundfish trawl fisheries must be sorted and discarded at sea or by the wholesale fish dealer when landed. Please contact ODFW Marine Resources Program at 541-867-4741 for details if you intend to use trawl gear to fish for squid.

Are there catch limits?

- There is no squid quota or fishing season. ODFW is required to hold a public meeting to evaluate the squid fishery before (or as soon after as possible) a squid harvest guideline of 4.5 million pounds are landed, with not more than 3 million pounds taken either north or south of Heceta Head.

March 2021 Commission

Adopted rules

- Rib line requirement
- Two day per week closure
- Light boat logbook requirement
- Include attraction by light in take definition
- Prohibit using lights to lure squid out of closed areas

Directed staff to consider

- Forming advisory body
- Control date for potential future limited entry
- Net size restrictions
- Vessel Monitoring System (VMS)
- If two day per week closure is sufficient for sustainability
- Impact on marine food web





Marine Resources

Market Squid Advisory Panel (MSAP)

Webpage:

dfw.state.or.us/MRP/market_squid/index.asp

10 members representing range of participants

Purpose

- Provide ODFW with industry perspective on effectiveness and impacts of regulations
- Identify emerging issues

Met in October and November 2021

Unanimous recommendations for control date and net specifications

Market Squid Advisory Panel

ODFW convened a Market Squid Advisory Panel in October 2021 to assist the agency by providing input on modifying market squid fishery regulations. The group of 10 panelists represent vessel operators and processors from along the West Coast.

Oregon's market squid fishery has grown dramatically since 2016, coinciding with surveys showing increased market squid populations off the Oregon coast. The market squid fishery began in Oregon in the early 1980s but catch and fishing effort generally were low. In the past five years, the number of vessels has increased to 40 some years and catch has risen to more than 10 million pounds in 2020.

The increase in market squid fishing has brought economic benefits to coastal fishing communities. It has also created the need for additional management measures to minimize bycatch of Dungeness crab and other species, reduce interactions between squid nets and Dungeness crab pots, and ensure the squid population remains productive into the future. The advisory panel will help ODFW marine fishery managers develop solutions to these and other issues.

Meeting schedule

2021 Meetings	Location	Agenda & Materials	Meeting Summary (pdf)
November 23	Virtual	Agenda	Meeting Summary
October 22	Virtual	Agenda	Meeting Summary

Purpose

The Market Squid Advisory Panel's (MSAP) purpose is to:

- Provide ODFW with information and industry perspective on the effectiveness and impacts of existing and proposed fishery management measures.
- Identify emerging issues that may need to be addressed.

The Oregon Fish and Wildlife Commission (Commission) requested evaluation of specific management measures in the near term: a control date for future development of a restricted participation permit system (i.e., limited entry), net size restrictions, and a vessel monitoring requirement. As long as there is a squid fishery in Oregon, the need for an advisory panel could continue for the foreseeable future.

Expectations

- Members are expected to represent perspectives of participants who are similarly situated, not limited to their own viewpoint. Members should reach out to contacts in their port, state, and/or sector to get broader input on topics under discussion and share that with the panel.
- MSAP meetings will be public and announced through a news release and on the ODFW website. Priority is given to discussion with members, with a brief opportunity for general public input at the end of each meeting if time allows.
- MSAP meetings will be held at least annually, with additional meetings as needed. Meetings will not be recorded, but ODFW staff will take minutes. Meeting summaries will be posted on this website.
- Members will have three-year terms and may be reappointed at ODFW's discretion. ODFW may also solicit applications for new members at any time to address gaps in representation or emerging needs.

MSAP members

Name	Affiliation	Sector
John Barry	FV Optimus	Harvester
Andrew Barnstein	Barnstein Seafoods	Processor
Clint Funderburg	FV Wildgion; Pelagic Fisheries, Inc.	Harvester
Pete Guglielmo	Southern Cal Seafood; FV Chase	Processor
Nick Jerkovich, Jr.	FV Pacific Raider; FV Pacific Grace; FV Pacific Ink; FV Squidlat	Harvester
Michael Lockabey	FV Pacific Nomad	Harvester
John Moody	Pacific Seafood	Processor
Joe Mulkey	FV Pearl J	Harvester
Jeff Oliver	FV Nordic Valor	Harvester
Josh Whaley	FV Miss Emily	Harvester



Limited Entry

Limited Entry – Permit system for limiting the number of vessels or people allowed to participate in a fishery

- Initial permit allocation usually based on qualifying criteria related to historical participation
- Can allow entry without historical participation
 - Lottery
 - Auction
 - Proof of investment
 - Transferability



Photo by Cameron Sharpe, ODFW



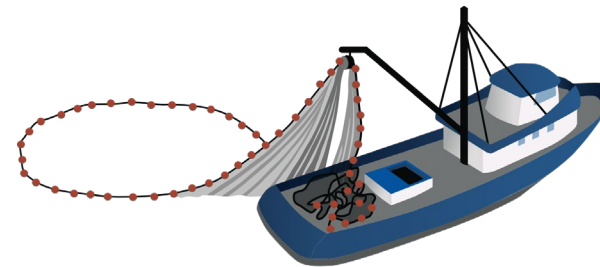
Limited Entry Control Date

Control Date – Cut-off date for considering historical participation in a fishery for potential future development of limited entry

- Often first step in considering limited entry
- Does not presuppose that limited entry will be implemented

Oregon control date examples

- Crab late-season limited entry – not implemented as limited entry to date
- Crab pot limits – control date 2001, program implemented 2006
- Black/Blue/Nearshore limited entry – control date 2001, program implemented 2004





Limited Entry Control Date

Year	Count of unique vessels		
	By year	Cumulative	New participants
2016	14	14	14
2017	<i>No landings</i>		
2018	11	20	6
2019	23	32	12
2020	40	49	17
2021	32	57	8

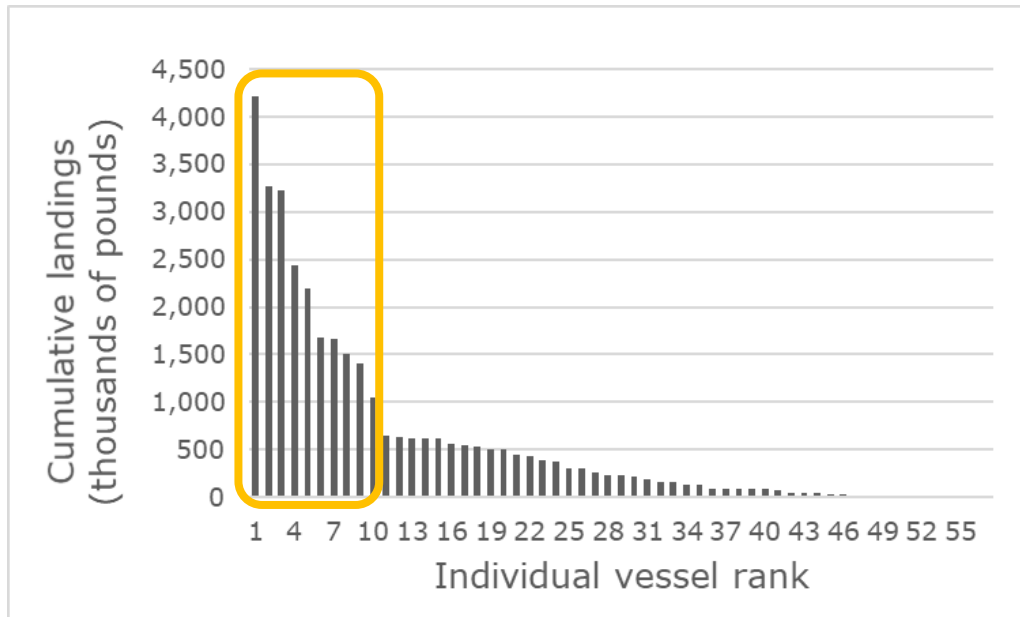
Years with landings	Count of Vessels
1	25
2	12
3	11
4	7
5	2
Total	57



Limited Entry Control Date

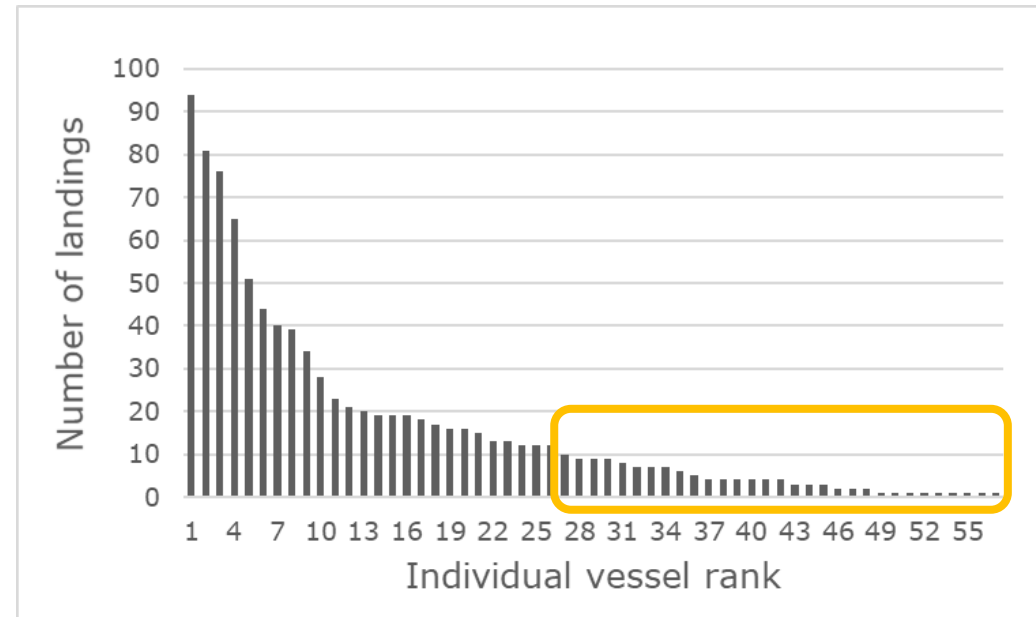
Signs of potential overcapitalization and speculation

A few vessels are very active



Pounds landed from by individual vessel from 2016-2021

Many with little activity



Number of landings by individual vessel from 2016-2021



Limited Entry Control Date

Reduce speculative fishing and associated impacts

Does not determine permit eligibility by itself

MSAP input

- Unanimous support for setting control date of January 1, 2022
- Only applicable to vessels using seine gear
- Mixed input on need and timeline for moving forward with limited entry

Staff Recommendation: Set a control date of January 1, 2022, for consideration of historical participation in the Oregon market squid seine fishery



Seine Net Specifications

Rib lines

- Current rule language could be circumvented
- Steel cable purse lines could damage habitat and egg beds, increase bycatch

Net size

- Deep nets (e.g., 360') can harvest squid before they reach shallow water spawning areas
- Large nets may lead to overharvest or excessive concentration among few vessels
- Impact of net length on crab pot interactions

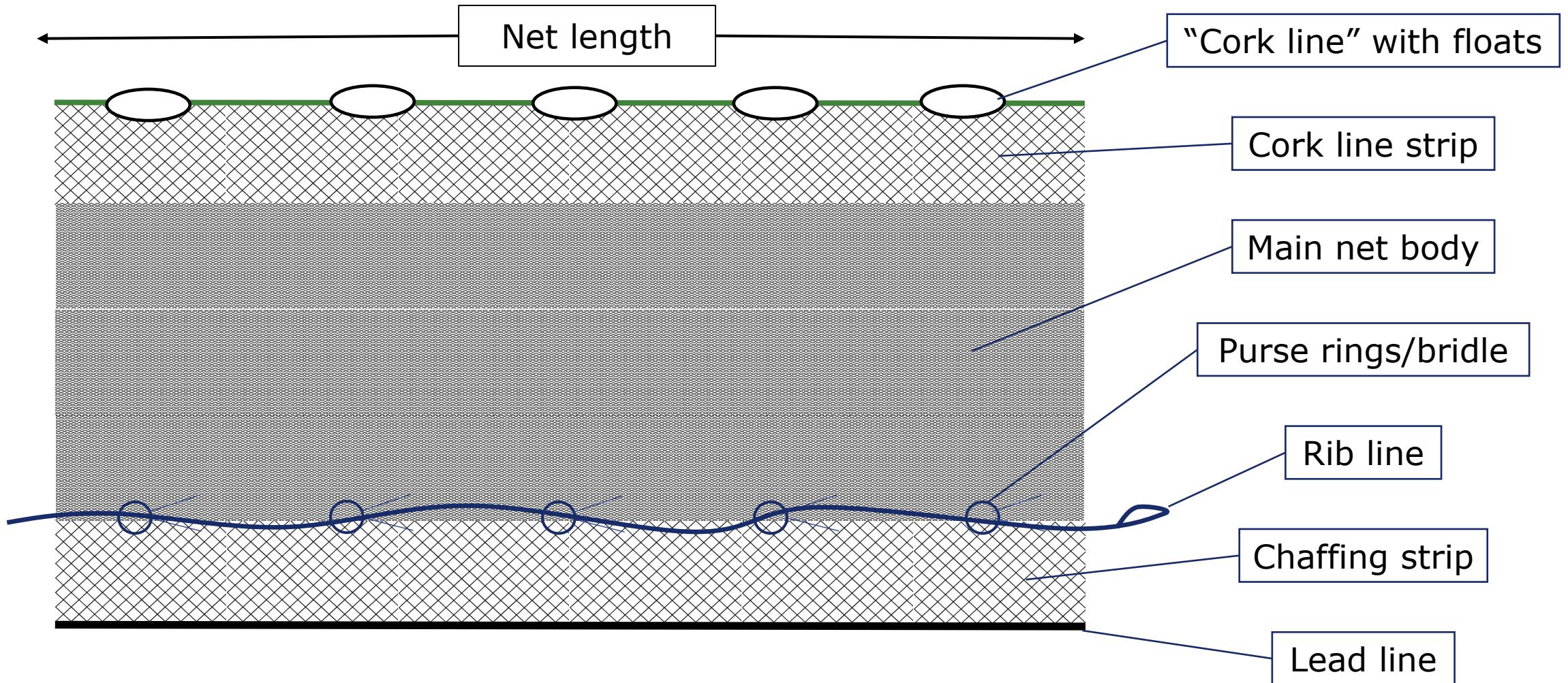
MSAP input

- Rib lines – unanimous support to prohibit cable purse lines and clarify rib line language
- Net size – robust discussion, over two meetings arrived at unanimous support to cap size

Staff Recommendation: Strengthen rib line regulations and specify maximum net size to prevent habitat impacts, bycatch, overharvest; minimize cost



Seine Net Specifications



Seine Net Specifications

Strengthen rib line regulations

- No purse line or bridle attached less than 36 inches above lead line
- Prohibit steel cable purse lines

Maximum net size

- No longer than 1,800 feet
- No deeper than 2,600 meshes
- Mesh size no greater than 1 $\frac{3}{4}$ inches, excluding chaffing strip and cork line strip
- No chaffing or cork line strip (bottom and top of the net) more than 25 meshes wide

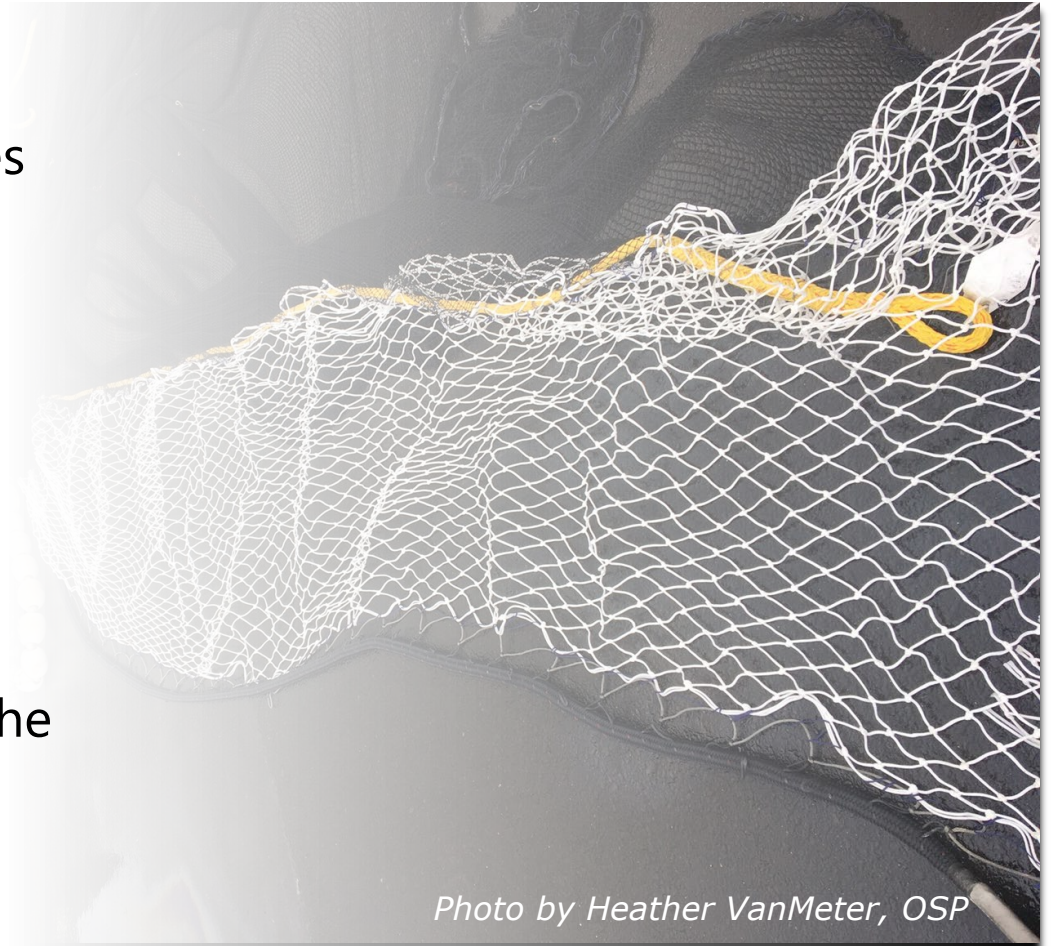


Photo by Heather VanMeter, OSP



Vessel Monitoring System (VMS)

Automated vessel location reporting system

No state system or requirement currently

Federal system and requirement in some fisheries

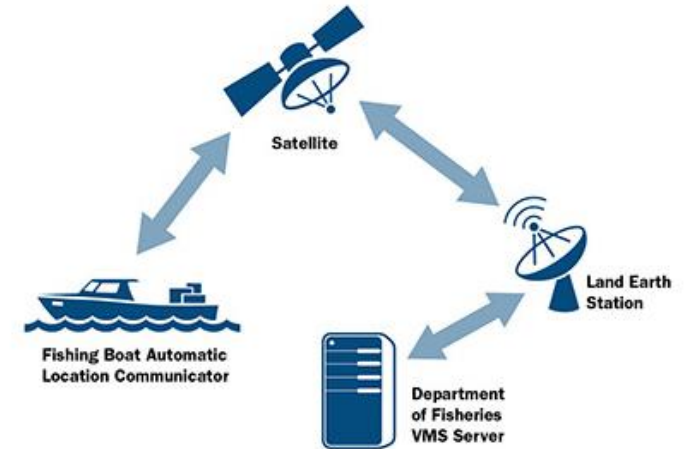
11 of 57 Oregon market squid vessels have federal VMS

State system in early development stage for Oregon crab fishery

MSAP input

- Squid fleet concentrated in space and time
- VMS ineffective for identifying individual vessels responsible for reported crab gear interactions

Staff do not recommend adopting a VMS requirement now



Weekly closures

Two day per week closure proxy for 30% egg escapement

Estimation of egg escapement by ODFW not feasible, requires

- Collection of fecundity (egg counts), mantle condition, and additional data
- Processing, analysis, and modeling of resulting data

Alternative metrics

- Compare no-fishing periods before/after implementation
- Data currently inadequate due to recent implementation

Infrequent evaluations of California fishery with similar closure found escapement goal usually met

Offshore spawning, weather days, closed areas provide additional escapement

Staff recommend continuing the two day per week closure until adequate data is available for evaluation (several years)



Food web and ecosystem impacts

Reviewed current state of science

Market squid in top five forage taxa consumed by most predators

Recent forage conditions in California Current ecosystem fair to good

Provided information on specific questions

- Chinook salmon – armhook squid important during offshore phase, importance of market squid uncertain
- Gray whales - not generally piscivorous, Pacific Coast Feeding Group relies on small crustaceans and amphipods
- Humpback whales – primarily eat krill, recent Critical Habitat designation identified several small schooling fishes as primary components of habitat but not squid.

Staff recommend relying on ongoing external research on California Current ecosystem status and impacts of forage fish fisheries



Looking Forward

Track catch and effort

Continue public hearings when Harvest Guideline approached

MSAP meetings at least annually

Fold management activity into ongoing ODFW work and responsibilities for all commercial fisheries

Address issues and recommend additional regulations as they arise



Staff Recommendation Summary

Adopt commercial market squid fishery management measures:

- Set a limited entry control date of January 1, 2022
- Specify maximum net size regulations
- Strengthen rib line regulations

Do not require vessel monitoring systems for market squid fishery

Continue two-day-per-week closure, evaluate when adequate data available

Track ongoing external research on the status of the forage base in the California Current ecosystem and the impacts of forage fish fisheries



Questions?



Photo by Heather VanMeter, OSP

