

APPLICATION FOR EFP TO ALLOW TAKE OF PACIFIC SARDINE IN 2018 NEARSHORE RESEARCH PROGRAM

SUBMITTED BY CALIFORNIA WETFISH PRODUCERS ASSOCIATION

NOVEMBER 2017

BACKGROUND

- AT ITS JUNE 2017 MEETING, THE PACIFIC FISHERY MANAGEMENT COUNCIL CONDITIONALLY APPROVED THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW) / CWPA AERIAL SURVEY METHODOLOGY FOR USE IN FUTURE CPS STOCK ASSESSMENTS,
 - CONSISTENT WITH RECOMMENDATIONS CONTAINED IN THE SOUTHERN CALIFORNIA COASTAL PELAGIC SPECIES AERIAL SURVEY METHODOLOGY REVIEW REPORT (*AGENDA ITEM D.2, ATTACHMENT 1, JUNE 2017*).
- **THE INTENT OF THIS EFP IS TO ADDRESS RECOMMENDATIONS FROM THE METHODS REVIEW TO QUALIFY THE AERIAL SURVEY METHOD FOR USE IN SURVEYING NEARSHORE AREAS NOW MISSED BY OFFSHORE NOAA ACOUSTIC SURVEYS**

PURPOSE AND GOALS

- CURRENT BIOMASS ESTIMATED FOR ANCHOVY AND SARDINE STOCKS IS BELIEVED TO BE NEGATIVELY BIASED, BECAUSE SUBSTANTIAL FRACTIONS OF THESE STOCKS RESIDE IN SHALLOW NEAR-SHORE WATERS ($< 70\text{M}$) THAT CANNOT BE SURVEYED BY NOAA VESSELS.
- THIS RESEARCH PLAN SEEKS TO ADDRESS RECOMMENDATIONS IDENTIFIED BY THE AERIAL SURVEY METHODS REVIEW PANEL (EXCERPTED FROM THE METHODOLOGY REVIEW REPORT):
 - **CONDUCT REPLICATE TRANSECTS AND SURVEYS TO ALLOW ESTIMATION OF VARIANCE FOR DENSITY.**
 - **THE PANEL RECOMMENDS THAT ADDITIONAL POINT SET DATA BE COLLECTED (OR ALTERNATIVE APPROACHES FOR GROUND-TRUTHING SURVEY ESTIMATES BE APPLIED, SUCH AS USING THE VOLUME OF SCHOOLS COMBINED WITH ESTIMATES OF PACKING DENSITY).**
 - **FURTHER WORK IS NEEDED TO DEVELOP A VARIANCE ESTIMATOR TO MORE FULLY ACCOUNT FOR THE VARIOUS SOURCES OF UNCERTAINTY**

SURVEY ELEMENTS ~ TRANSECTS

2018 CPS Nearshore Cooperative Survey
Aerial Transects



- 2 SPOTTER PILOTS (FLYING IN SAME PLANE) WILL FLY REPLICATE TRANSECTS OVER A 7 DAY PERIOD AND MAKE INDEPENDENT ESTIMATES OF SCHOOL SIZE AND SPECIES COMPOSITION.
- SCHOOLS WILL BE PHOTOGRAPHED WITH AERIAL IMAGING SOLUTIONS FORWARD MOTION COMPENSATING (FMC) MOUNTING SYSTEM WITH NIKON D700 CAMERA

Two strata, 3 replicates for each line. Transect lengths based on feasible flight day; locations based on prior observations. Goal is obtain info. on abundance nearshore to offshore.

PILOTS WILL FILL OUT LOGS DOCUMENTING SCHOOLS OBSERVED

2018 CPS Nearshore Cooperative Survey

Flight Log Form

Date: _____ Pilot: _____ Plane: _____

Processor: _____ Observer: _____

Set #	Time	Photo #	Position (Lat/Long)	Altitude (ft)	Vessel	Species Observed	% of School Captured	Est. school Tonnage (mt)	% Species Composition

Comments: _____

Set #	Time	Photo #	Position (Lat/Long)	Altitude (ft)	Vessel	Species Observed	% of School Captured	Est. school Tonnage (mt)	% Species Composition

Comments: _____

Set #	Time	Photo #	Position (Lat/Long)	Altitude (ft)	Vessel	Species Observed	% of School Captured	Est. school Tonnage (mt)	% Species Composition

Comments: _____

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Comments: _____

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Comments: _____

Set #	Time	Photo #	Position (Lat/Long)	Altitude (ft)	Vessel	Species Observed	% of School Captured	Est. school Tonnage (mt)	% Species Composition

Comments: _____

SURVEY ELEMENTS ~ POINT SETS

- PILOTS WILL IDENTIFY RANDOM CPS SCHOOLS OF VARIOUS SIZES AND DIRECT VESSELS TO SET ON SCHOOLS
- VESSEL(S) WILL ATTEMPT CAPTURE OF 100% OF TARGET SCHOOLS
 - SCHOOLS WILL BE STORED IN SEPARATE HATCHES
- BIOLOGISTS ONBOARD WILL SAMPLE SCHOOLS FOR BIOLOGICAL CHARACTERISTICS
- PROCESSORS WILL WEIGH INDIVIDUAL SCHOOLS AND FULLY SORT EACH SCHOOL FOR SPECIES COMPOSITION
- POINT SETS WILL VALIDATE SPOTTER PILOT ESTIMATES

Example of Point Set distribution from
Fall 2010 Southern California Pilot Sardine Survey

Surface Area (m ² /set)	mt/set	Number of point sets	Total mt
100	3.8	3	11.4
500	10.6	4	42.4
1000	17	5	85
2000	26.5	6	159
4000	51.9	4	207.6
8000	70.5	3	211.5
10000	82.1	1	82.1
Total		26	799

Point sets will be made randomly on various sized CPS schools identified by the spotter pilot. The surface area and tonnage estimate will include all CPS. Sardines as a portion of sets will be recorded and will not exceed 500 mt.

FISHERMEN WILL FILL OUT LOGS DOCUMENTING INDIVIDUAL POINT SETS

- FISHERMEN WILL ALSO HAVE GO PRO CAMERAS MOUNTED ON THEIR CONSOLES TO RECORD SONAR AND FATHOMETER DURING SETS, AND CAN ALSO RECORD THEIR OBSERVATIONS ON SCHOOL SIZE, COMPOSITION AND DENSITY

2018 CPS Nearshore Cooperative Survey Fisherman's Log Form

Date: _____ Captain: _____

Vessel: _____ Processor: _____

Hydroacoustic Gear

Type	Manufact.	Model	Frequency
Sounder			
Sonar			

Net Dimensions

Net Length (fath)	Net Depth (fath)	Mesh Size

School and Ocean Data

Point Set No.	Time	Latitude	Longitude	Depth to Top of School (fath)	Depth to Bottom of School (fath)	Ocean Depth (fath)	Temp.	Weather Condition

Captains Estimate and Delivery Information

Office Use Only

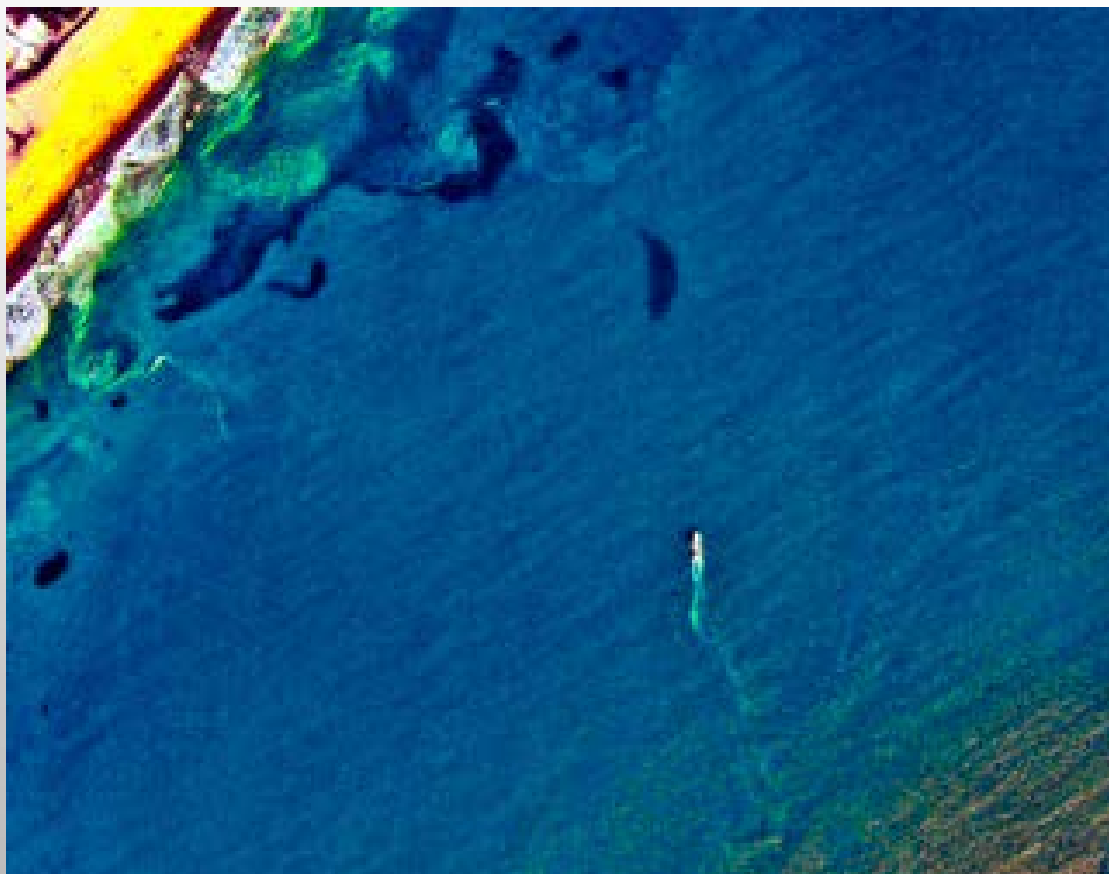
Point Set No.	Species Observed	% of school captured	Total Est. School Tonnage (mt)	Fish Hold (FP, FS, MP, MS, AP, AS)	Sampled By Biologist on Board (Y/N)	Other Vessel utilized: Name, est. weight, fish hold	*Delivered Weight (mt)	*Fish Ticket Number

Comments: _____

Weather Codes: 1= calm, clear; 2= light wind, good visibility; 3= moderate wind, fair visibility; 4= poor fishing conditions.

EXAMPLE OF POINT SET FROM 2010 SARDINE SURVEY

- APPROACHING 20 TON SCHOOL



- WRAPPING SCHOOL



RATIONALE FOR THIS EFP

- **THERE IS A CRITICAL NEED TO SURVEY INSHORE OF CURRENT NOAA CRUISES TO IMPROVE ACCURACY OF CPS STOCK ASSESSMENTS**
- THE COUNCIL CONDITIONALLY APPROVED CDFW/ CWPA AERIAL SURVEY METHODOLOGY AFTER ADDRESSING RECOMMENDATIONS
 - NEED TO DEVELOP A VARIANCE ESTIMATOR TO MORE FULLY ACCOUNT FOR THE VARIOUS SOURCES OF UNCERTAINTY IN SPOTTER PILOT ESTIMATES
- FISHERMEN HAVE OBSERVED ABUNDANCE OF SARDINE NEAR SHORE FOR PAST FEW YEARS, BUT FISHERY IS CLOSED SO EFP IS NEEDED TO ALLOW CAPTURE OF SARDINE IN EVENT SCHOOLS CONTAIN $> 40\%$ SARDINE BY WEIGHT OR ARE PURE SCHOOLS.
- **EFP WILL ALLOW FISHERMEN TO RETAIN THE ENTIRETY OF ANY SCHOOL THEY ARE DIRECTED TO CATCH, INCLUDING PURE SARDINES OR MIXED SCHOOLS EXCEEDING THE ALLOWED 40% INCIDENTAL CATCH RATE.**
 - **ABSENT AN EFP, FISHERMEN WOULD BE LIMITED IN TARGETING OBSERVED SCHOOLS, OR RISK A VIOLATION**
- FISH WILL BE SOLD TO AUGMENT SURVEY EXPENSES AND AVOID WASTING A VALUABLE RESOURCE.
- TO SIMPLIFY ACCOUNTING, WE SUGGEST THAT THE COUNCIL FOLLOW THE PROTOCOL ESTABLISHED FOR OTHER EFPs AND DESIGNATE THE **500 MT SARDINE REQUESTED** IN THIS EFP AS A RESEARCH SET ASIDE OFF THE TOP OF THE ACL, SEPARATE FROM THE INCIDENTAL CATCH ALLOWANCE. ANY AMOUNT UNUSED WOULD SIMPLY ROLL BACK INTO THE ACL AT THE CONCLUSION OF THE RESEARCH PERIOD.

SIGNIFICANCE OF THIS EFP

- **THIS RESEARCH IS ESSENTIAL TO DEVELOP USEFUL AND COST-EFFECTIVE SURVEY METHODS TO QUANTIFY THE BIOMASS OF CPS IN THE NEAR-SHORE AREA WHERE LARGE NOAA SHIPS CANNOT TRANSECT.**
- SURVEY METHODS DEVELOPED IN THIS PROJECT CAN BE EXPANDED TO OTHER NEAR-SHORE AREAS COAST-WIDE, WHICH WOULD IMPROVE THE ACCURACY OF FUTURE STOCK ASSESSMENTS.
- COLLABORATION BETWEEN INDUSTRY, THE SCIENTIFIC COMMUNITY, AND FEDERAL AND STATE AGENCIES IS A WIN–WIN FOR ALL
 - FACILITATES INCREASED UNDERSTANDING OF THE UNCERTAINTIES IN QUANTIFYING HIGHLY VARIABLE CPS RESOURCES,
 - UTILIZES FISHERMEN’S KNOWLEDGE OF THE OCEAN AND
 - PROVIDES A PRACTICAL, EFFICIENT METHOD FOR MEASURING FISHERY RESOURCES.

CONTINUATION OF THIS EFP

- CONTINGENT ON A NUMBER OF FACTORS, CHIEF AMONG THEM SUFFICIENT FUNDING TO CONTINUE AND POSSIBLY EXPAND THE SURVEY, AND THE STATUS OF THE SARDINE FISHERY IN THE FUTURE.
- **PROBABILITY IS THAT THIS EFP OR A SIMILAR PROPOSAL WILL BE NEEDED IN FUTURE YEARS** UNTIL SURVEY METHODS AND STOCK ASSESSMENTS FULLY ACCOUNT FOR THE ABUNDANCE OF SARDINE AND THE FISHERY IS REOPENED WITH SUFFICIENT HARVEST OPPORTUNITY THAT WOULD ALLOW FOR A YEARLONG FISHERY.

PARTICIPATING VESSELS AND PROCESSORS

- CWPA HAS IDENTIFIED 4 VESSELS THAT MEET THE CRITERIA FOR THIS RESEARCH PROJECT:
 - PURSE SEINE VESSEL WITH MULTIPLE HATCHES
 - EXPERIENCED SKIPPERS WITH KNOWLEDGE OF CPS AND RESEARCH OBJECTIVES
 - COMMITMENT TO FISH DURING PROJECT PERIOD NOTWITHSTANDING OTHER FISHING OPPORTUNITIES AT THE TIME
 - VESSELS WILL ROTATE FISHING DAYS IN COLLABORATION WITH PROJECT COORDINATOR
- 2 PROCESSORS WILL PARTICIPATE
 - EACH MARKET OFFLOADS FOR 2 PARTICIPATING VESSELS
 - BOTH MARKETS AGREED TO WEIGH AND CONDUCT FULL SORT OF INDIVIDUAL POINT SETS AND QUANTIFY SPECIES COMPOSITION BY WEIGHT OF EACH SET
- CWPA WILL ALSO TRACK LANDINGS BY SPECIES AND MONITOR EFP LANDING LIMIT
 - ANY EFP FISH NOT CAUGHT IN THIS RESEARCH WILL BE RETURNED TO THE ACL.

DESCRIPTION OF SPECIES HARVESTED

- PURSE SEINE VESSELS WILL BE DIRECTED TO CAPTURE SCHOOLS OF CPS OBSERVED BY AERIAL SPOTTER PILOT (OR POTENTIALLY, BACKSCATTER OBSERVED BY ACOUSTIC TRAWL).
 - **SCHOOLS COULD CONTAIN SARDINE, ANCHOVY, PACIFIC OR JACK MACKEREL, OR OTHER COASTAL PELAGIC SPECIES.**
- **AN EFP IS NECESSARY BECAUSE THE DIRECTED SARDINE FISHERY IS CLOSED, AND MAY REMAIN CLOSED IN 2018.**
- THERE ARE NO CONSTRAINTS ON CAPTURING THE OTHER CPS SPECIES OTHER THAN ANNUAL CATCH LIMITS, WHICH THIS PROJECT WILL NOT EXCEED.
- **NO MEASURABLE IMPACTS TO NON-TARGET SPECIES ARE ANTICIPATED.**

JUSTIFICATION FOR EFP REQUEST

- **EFP APPLICATION REQUESTS 500 MT** BE ALLOCATED AS A RESEARCH SET ASIDE FOR A 7-DAY RESEARCH PROJECT, WHICH AMOUNTS TO **AVERAGE OF 71 MT PER DAY**.
- **IN LIGHT OF RECENT-YEAR OBSERVATIONS OF ABUNDANT SARDINE IN NEAR-SHORE WATERS, THE LIKELIHOOD IS THAT SETS WILL CAPTURE SARDINE, EITHER IN PURE SCHOOLS OR IN MIXED SCHOOLS EXCEEDING 40% INCIDENTAL CATCH OF SARDINE BY WEIGHT.**
 - **WITHOUT AN EFP, SUCH CAPTURES WOULD BE IN VIOLATION.**
- THE ISSUANCE OF AN EFP ALSO ALLOWS THE SALE OF THE FISH TO HELP OFFSET COSTS INCURRED BY PARTICIPATING FISHERMEN AND PROCESSORS.
- **THIS EFP WILL FACILITATE FULFILLING THE GOALS AND OBJECTIVES OF THIS ESSENTIAL RESEARCH AND WILL AVOID WASTING A VALUABLE RESOURCE.**

ACCOUNTING FOR EFP FISH

- BIOLOGISTS WILL ACCOMPANY THE VESSELS DURING PURSE SEINE CAPTURES TO SAMPLE INDIVIDUAL SETS,
 - AND WILL TAKE A SUBSET OF EACH SET FOR LATER PROCESSING TO OBTAIN BIOLOGICAL CHARACTERISTICS OF INDIVIDUAL FISH.
- ALL SCHOOLS CAPTURED WILL BE STOWED IN INDIVIDUAL HATCHES IN THE HOLD,
 - AND WHEN DELIVERED TO MARKET EACH SET WILL BE WEIGHED AND FULLY SORTED FOR SPECIES COMPOSITION.
- PROCESSORS WILL MAINTAIN RECORDS OF THE WEIGHT OF INDIVIDUAL SPECIES GROUPS, INCLUDING SARDINE, TO VALIDATE SPECIES COMPOSITION.
- CWPA WILL ALSO MAINTAIN A RECORD OF THE VOLUME / TOTAL WEIGHT OF EACH SPECIES CAPTURED, SET BY SET, AND WILL MONITOR PROGRESS TOWARD ATTAINING THE EFP LIMIT.
- WEIGHTS AND SPECIES COMPOSITION PER SET WILL ALSO BE INCLUDED IN THE FINAL REPORT.

DATA COLLECTION METHODS

- BIOLOGICAL SAMPLING

- BIOLOGISTS WILL SUBSAMPLE THE FISH AT THE BEGINNING, MIDDLE, AND END OF PUMPING EACH SET ABOARD THE VESSEL
- ALL COLLECTED FISH SAMPLES WILL BE DELIVERED TO A CDFW BIOLOGIST UPON LANDING OF THE DAILY CATCHES.
- AT CDFW LABORATORIES SAMPLES WILL BE SORTED BY SPECIES AND MEASURED FOR BIOLOGICAL CHARACTERISTICS (LENGTH, WEIGHT, SEX, MATURITY ETC.).
- FOR EACH SPECIES AND EACH SCHOOL, THE CATCH WILL BE ADDITIONALLY SUBSAMPLED TO OBTAIN UP TO 50 OTOLITHS FOR AGEING.

DATA COLLECTION METHODS

- STATISTICAL ANALYSES (*EXCERPT FROM DRAFT SURVEY PLAN*)
 - CPS BIOMASS AND ASSOCIATED VARIANCES WILL BE ESTIMATED FROM DATA COLLECTED DURING THE AERIAL AND PURSE SEINE SURVEY
 - SAMPLING UNIT OF THE SURVEY WILL BE ONE TRANSECT FLOWN FOR A NUMBER OF HOURS DURING THE DAY
 - PURSE SEINE DATA WILL BE USED TO VALIDATE AERIAL TONNAGE ESTIMATES, SCHOOL SPECIES COMPOSITION, AND LENGTH, AND AGE COMPOSITION ..., PROVIDING ADDITIONAL INFORMATION TO QUANTIFY UNCERTAINTY SURROUNDING BIOMASS ESTIMATED BY THE PILOT AND OBSERVER.
 - **MORE DETAILS REGARDING THE PROCESS OF BIOMASS ESTIMATION WILL BE PROVIDED IN A SEPARATE DOCUMENT.**
- SCIENTIFIC DATA COLLECTION AND ANALYSIS WILL BE SUPERVISED BY CDFW AND CWPA SCIENTISTS, WHO WILL COLLABORATE ON PROCEDURES TO ENSURE AND EVALUATE DATA QUALITY DURING THE SURVEY, AND DATA ANALYSIS METHODOLOGY THROUGH COMPLETION OF THE PROJECT.

TIME AND PLACE OF RESEARCH FISHING

- THIS PROJECT WILL TAKE PLACE IN NEAR-SHORE WATERS OF THE SOUTHERN CALIFORNIA BIGHT.
- TENTATIVE TIME FRAME FOR THE SURVEY IS LATE AUGUST 2018.
- IF TIMING AND SUFFICIENT FUNDING PERMIT, THIS PROJECT WILL ALSO COORDINATE WITH THE 2018 NOAA SUMMER SURVEY, IF THE RV REUBEN LASKER IS SURVEYING OUTER WATERS ON SCHEDULE.
- FISHING GEAR USED IS PURSE SEINE NET OF SUITABLE MESH SIZE AND LENGTH FOR CAPTURING CPS SCHOOLS OBSERVED BY AERIAL SPOTTER PILOTS (OR POTENTIALLY BY ACOUSTIC BACKSCATTER).

IN SUMMARY

- **LARGE BIOMASS OF CPS NEAR SHORE IS MISSED IN CURRENT NOAA ACOUSTIC SURVEYS**
 - ESSENTIAL TO SURVEY THIS AREA TO IMPROVE ACCURACY OF STOCK ASSESSMENTS
- **COUNCIL CONDITIONALLY APPROVED USE OF AERIAL SURVEY METHOD AFTER VARIANCE ESTIMATOR IS DEVELOPED TO QUANTIFY UNCERTAINTY IN SPOTTER PILOT OBSERVATIONS**
- **EFP IS NEEDED TO AUTHORIZE TARGETING OF RANDOM SCHOOLS THAT MAY INCLUDE SARDINE**
 - SALE OF FISH ALSO AVOIDS WASTE AND AUGMENTS SURVEY EXPENSES
- THIS SURVEY IS SIGNIFICANT:
 - **FACILITATES INCREASED UNDERSTANDING OF THE UNCERTAINTIES IN QUANTIFYING HIGHLY VARIABLE CPS RESOURCES,**
 - **UTILIZES FISHERMEN'S EXPERTISE AND KNOWLEDGE OF THE OCEAN AND**
 - **PROVIDES A PRACTICAL, EFFICIENT METHOD FOR MEASURING FISHERY RESOURCES.**
- **WE WOULD GREATLY APPRECIATE YOUR SUPPORT!**
- THANK YOU.

QUESTIONS?

