

Notes from Central Coast MPA Symposium February 27 to March 1 Monterey
by Paul Reilly

Day 1:

Michael Sutton: Fish and Game Commission will use adaptive management with MPAs.

John Laird: The MPA network will be a legacy, which is why it was so difficult and took so long.

Fred Keeley: F&G Commission is the only Commission enshrined in the State Constitution. Unless you are a marine scientist, the ocean looks the same today (meaning, from above) as it did 1 million years ago.

Paulo Serpa: Within the central coast, all habitats except sediment had >18% captured within MPAS.

Susan Ashcraft: DFW has a mobile MPA site for smart phones, and 25,000 new, enhanced brochures with landmarks. We now have an MR Outreach team.

Capt. Don Kelly: One third of all 69 CalTip calls in 2012 were reporting MPA violations. Sylvia's Earle's son is a DFW Law Enforcement Division officer. A court levied a \$4,000 fine for an Elkhorn Slough MPA violation.

Sonke Mastrup: Management should be based on reality, but not everyone shares the same reality.

Cat Kuhlman: \$96 million has been expended in ocean research (did not clarify this) with \$42 million from OPC funds. The baseline monitoring program was a \$4.1 million investment.

Monitoring

Mark Carr (for Pete Raimondi): State of California is now recognized as a global leader in MPAs.

Six distinct intertidal communities exist, characterized by macro-algal cover, macro-inverts, and degree of wave exposure. Black abalone and owl limpets showed big increases in mean size within MPAs. A collection of only eight selected species would be sufficient to characterize intertidal change.

Mark Carr: Seven distinct subtidal fish communities were described, each with at least one MPA. MPAs at Cannery Row and Carmel Bay showed significant increases of fish inside MPAs, while Pt. Buchon showed decreases. Cabezon and grass and black rockfishes tended to increase within MPAs. Copper rockfish declined relative to reference areas, but may not be showing an overall decline. Black, blue, gopher, kelp and grass rockfishes are best scuba-surveyed species for detecting changes. For a given species, responses differed among MPAs.

Jan Freiwald (Reef Check): Benthic surveys only, 74 target organisms in 5-18 m depth. Most sites are along Monterey Peninsula, and in Carmel Bay and Point Lobos; 250 active divers. Inverts and alga counts are most similar to PISCO data but blue rockfish, kelp rockfish, and striped perch densities are generally lower because PISCO counts above bottom also. Some species were already more abundant within SMRs in 2007. His data analyses for rockfishes combined olive and yellowtail, and vermilion and canary rockfishes, due to uncertainty in IDs.

Rick Starr: In 5 years, at and adjacent to four MPAs, 44,877 fish representing 46 species have been caught and released by a total of 665 volunteer anglers, with the majority tagged. Eleven species comprised 90% of the catch. Sites were clustered based on species composition, and the old Pt. Lobos SMR is in a class by itself. During the first year, CPUE was higher in all MPA sites compared with reference sites except at Año Nuevo. They still are not seeing adult black rockfish. Their tagging has shown some black rockfish moved as far north as Oregon. Blue rockfish showed an overall decline within MPAs, presumably due to oceanographic effects.

Rick thinks that DFW should take over the long-term monitoring in this depth range (60-120 feet).

Mike Prall: ROV surveys were done from 2007 to 2009. One hour of video takes 3 hours to process. Best species for analyses are lingcod and blue, olive, rosy and vermilion rockfishes. His abundance data were log-transformed because blue rockfish were so abundant. There were not many rosy rockfish at Pt. Sur SMR, unlike other SMRs. They identified 38 species of fish. Additional ROV surveys were done by MARE at Pt. Buchon in 2012; more legal lingcod were observed than in 07-09. Dan Gotshall and Rebecca Flores-Miller identified 80 species of invertebrates from video.

Rick Starr: Completed 709 submersible transects, with 123 fish species, 174,000 fish counted. Seventy-five percent of central coast MPAs include deeper waters (20-265 m depth). They found fewer rockfish of fished species at Portuguese Ledge SMCA than at Soquel SMCA. He believes the effect of the RCAs on rockfish abundance “blows away” any MPA effects. They documented ontogenetic effects for some rockfishes. Not all high relief substrate supports abundant fish.

Debbie Aseltine-Neilson: Big increase in sport fishing effort from 2008 to 2011, salmon-influenced. An estimated 37% of private and rental boat trips occurred in DFG blocks (10 min. latitude by 10 min. longitude) containing MPAs.

Cheryl Chen: From 1992 to 2011 the number of commercial fishermen declined from 1100 to 342 but the highest ex-vessel value occurred in 2011 (squid-influenced). The spot prawn trap fishery out of Moss Landing lost 100% of its fishing grounds due to MLPA. Her spot prawn landings data graph for Morro Bay has an error for 2011. She interviewed 12 CPFV operators and 29 commercial fishermen to determine impacts from creation of MPAs. The Pt. Buchon MPAs impacted more commercial fishermen than other MPAs; the Pt. Sur MPAs impacted more CPFV operators than other MPAs.

Terry Tillman: discussed analysis of 1.5 million commercial landings records from 2000 to 2011 to look at pre- and post-MPA effects, but did not present data separately for specific fisheries. From 2007 to 2008 there was a sharp attrition in effort (salmon-influenced). A higher diversity of gears was used by fishermen post-MPA implementation. A total of 566 individuals with very low income from fishing dropped out completely from 2008 to 2011. Aggregate revenues for fishermen have increased from pre- to post-MPA implementation, but fishermen not impacted by MPAs are doing better.

Day 2

Zeke Grader: Zeke opened the second day on a somber note considering that the symposium had been largely celebratory until then. Some fishermen have lost their livelihood due to MLPA implementation. He described three major challenges for the future:

1. We do not have a regular monitoring program involving fishermen;
2. The state has not addressed the issue of long-term funding for monitoring; changing DFW's name was not the solution; the federal sequester will cause a big hit in federal research;
3. Our MPAs are not protected areas, but rather just no-fishing areas. They do not address the issues of runoff, dumping, seismic surveys, and fracking.

He concluded by saying that there are less obvious relationships of predator/prey which may mask the effects of MPAs.

Francisco Chavez: upwelling can occur from late Feb to early Nov. The California current has been relatively cool for the past 15 years. The warmest SSTs are always in Sept-Oct. Temperatures measured during the baseline monitoring of 2007-08 were cooler than the 25-year average. The planet as a whole is warming but the central coast is cooling. The period 1999-2013 is a cooler regime, with less oxygen in the water and marked by the appearance of Humboldt squid.

Rikk Kvitek: From 2005-2013 \$25 million in public/private partnership funds were spent to map with high resolution all state waters except the white zone (too shallow for traditional multi-beam sonar vessels; he has the Kelpfly now but no funds to process data). The Marine Life Management Act and Essential Fishery Habitat needs were the primary justification for the work. The MLPA stakeholder groups did not have the benefit of the complete maps for their deliberations- it seems like Kvitek's group was just slightly behind the pace. One example, the Piedras Blancas MPA complex actually had 3-4 times more rock than was thought during the MLPA process. His work discovered significant occurrences of ripple-scour depressions in soft sediment, which are excellent habitat for young-of-the-year (YOY) rockfishes, particularly canary and yellowtail.

Bob Farrell: Statewide in 2012 there were a total of 259 MPA-related CalTip calls for 36 MPAs; 22 of these involved 10 central coast MPAs. 9.5% of marine-related central coast violations involved MPAs. He emphasized that even a single violation has the potential to undermine the performance of an MPA, and showed a photo of an illegal longliner within

the Cowcod Conservation Area. The Vessel Monitoring System (VMS) system is very effective for spatial management but it is only required for federal groundfish vessels.

Gerald McChesney: Brandt's cormorants are the most abundant breeding seabird along the central coast (ca. 10,000 nest for 20,000 adults). Low reproduction occurred in 97-98 and 07-08. Ravens and pelicans disturb colonies of common murre, which are less affected by prey abundance than other seabirds. He mentioned that Special Closures, which were adopted for the North Central and North Coast MLPA regions, would be helpful in the Central Coast to afford additional protection for seabirds.

Karen Worcester: The Central Coast has most intensive agriculture in the world (e.g. triple cropping). The watershed of the Salinas River contains 1/3 of the land area of the Central Coast counties- runoff is a big issue. Anthropogenic nitrate and urea may initiate toxic phytoplankton blooms. Elkhorn Slough and Morro Bay MPAs are impacted by water quality issues. She had a photo of a jar of water taken from Pinto Lake in Watsonville which was the color and consistency of split pea soup.

Erin Loury: Sampled 1,018 gopher rockfish from 2007 to 2009 within and adjacent to four MPAs (Año Nuevo, Pt. Lobos, Pt. Buchon, Piedras Blancas) to look at prey; 710 of these had food in their stomachs. Used a Prey Specific Index of Relative Abundance. In general, crustaceans comprised 70% of diet followed by 18% echinoderms. Brittle stars were more important at Pt. Lobos and Piedras Blancas, crabs were more important at Año Nuevo, and mysids were more important at Pt. Buchon. There were no consistent trends in specialization inside and outside of MPAs (i.e. same diets); geography was the biggest factor in prey composition. Predator density was not a factor.

Ashley Knight: ROV monitoring at 50-250 m depths; 160 km of transects were completed in central coast state waters, with 60 km in MPAs. At Piedras Blancas, 8,000 fishes (half of these rockfishes) were recorded representing 32 species (18 rockfish species). It was difficult to identify some rockfish, all flatfish, and all YOY fish to species.

Kerry Nickols: Pt. Lobos has been surveyed by PISCO since 1999. A big drop in blue rockfish was observed from 2006 to 2007, not MPA related. There was no clear trend in size of blue rockfish inside and outside of this MPA. There may be migration of oldest fish offshore (my note: however- see Schmidt, page 5). They did not age fish- only estimated lengths during scuba surveys. Factors like this need to be accounted for in any modeling.

Jay Carroll: The waters adjacent to Diablo Canyon Power Plant have been a de facto MPA since 2001 when security measures made them off limits to access; they are adjacent to the Pt. Buchon SMR. There have been 157 scuba surveys there since 1976 but no non-MPA comparisons. Length data for fishes have been recorded only since 2004. A big decline in blue rockfish abundance has been observed over a 30-year period since 1984. Fish assemblages have changed dramatically several times since 1976 due to ocean regime shifts. They have excellent data on cabezon, grass rockfish, and striped seapech,

which show the former two species were impacted by the nearshore live fish fishery in the '90s. Since 2004 there has been a significant increase in abundance and mean size for these two species in the de facto MPA.

Foirenza Micheli: In Isla Navidad, Baja California, a voluntary no-take area was established for abalone in 2006 by fishermen. Since then, a lethal hypoxia event occurred with significant mortalities to abalone. Recruitment was maintained within the voluntary reserve but not in fished areas, due to higher densities of abalone. Demonstrates local recruitment effects of abalone with short larval duration- not much spillover. She said that without the reserve, the abalone catch would eventually collapse. They have documented some 1-2 day hypoxia events at Hopkins Marine Station.

David Lohse: Predictions of sea level rise by 2011 from global warming disagree, but all conclude at least 10-20 cm. This amount happens to be the typical variation of the upper limit of a rocky high intertidal species along the central coast.

William Sydeman: The variation in growth rates of splitnose rockfish is discernible from otoliths. The last major El Niño of 1997-98 shows reduced growth. Moral of story: MPA effects may be masked by environmental factors.

Jerrold Norton: The period 2002-05 was the one with the most consistent kelp beds surveys (aerial and scuba combined) by DFW and PISCO. Number of stipes per transect is a measure of productivity. An overall decrease in productivity occurred south of Cambria.

Katherine Schmidt: Fishery-induced evolution may cause fish to mature at younger ages and smaller sizes, and have increased fecundity per size/age plus show changes in growth rates. She stated (incorrectly according to Deb Wilson-Vandenberg, DFW) that vermilion, black, and blue rockfish qualify as overfished, and that blues are now at 30% of their virgin biomass. She compared data for blue rockfish now with that by Echeveria in the 1960s. Length at 50% maturity is now 230 mm, was 270 mm. Age at 50% maturity was 6-7 years, now at 4-5 years. Growth rates have declined. She attributes these changes to high fishing pressure on blues in the past.

Scott Toews: Documented rocky subtidal habitat distribution along Monterey Peninsula. Used four primary factors- relative percentage of red algae, laminarians, articulated coralline algae, and biogenic habitat, to determine changes. He geo-referenced photo quadrats using GPS. He also observed that black surfperch selected largest gammarid amphipods as prey items, compared with available size range.

Melissa Foley: She looked at impacts on intertidal cover from human disturbance, and found that relative abundance of *Ulva* increases and relative abundance of crustose coralline algae decreases with increased human disturbance.

Steve Shimek: Since 2011 his MPA Watch volunteers have conducted 3,000 surveys of human use within MPAs to date. These are 1-hr walking surveys along the shore in the

area from Bean Hollow, San Mateo County to Pt. Buchon. He said they are filling a need for compliance data, and said that he has talked to DFW's LED staff about whether or not his volunteers should actually have conversations with potential violators (he did not say what was the result of that conversation). He thinks non-compliance happens everywhere. One of his volunteers erroneously reported a CPFV fishing inside Point Lobos- it was actually Rick Starr's collaborative fisheries monitoring study doing catch and release.

Paul Hobi: Outreach for MPAs is critical. AGP Video from Morro Bay broke new ground by broadcasting all the MLPA stakeholder meetings. Friends of Elephant Seals volunteers talked to 157,000 visitors last year at Piedras Blancas. He mentioned a 2012 article in Sunset Magazine about our MPAs called "Big News Under the Sea".

John Pearse (for Ann Wasser): First John Pearse and students, and then the program LiMPETS have been conducting intertidal surveys for 38 years at Natural Bridges in Santa Cruz, include inside and outside the SMR established in 2007. This is one of the most visited rocky intertidal sites along the Central Coast. Owl limpets are highly collected, both legally and illegally. At Almar Avenue, outside the SMR, they are poached. Visitors at Natural Bridges scare away natural predators (oystercatchers) and there is good public outreach so size distributions of owl limpets are robust there within the SMR. Along Wilder Ranch, outside the MPA, no owl limpets were found last year (poaching). At Davenport, outside the MPA, most owl limpets are gone, and mussel cover has increased. Mussel beds have shown little change in 38 years. LiMPETS is cost effective, but funds are tight. Data are available on their web site.

Day 3

Dennis Long: MLPA process evolution occurred in four steps- uniformed enthusiasm to informed disillusion to informed optimism to meaningful outcomes and enduring partnerships. There are ca. 6 million visitors to the Central Coast each year.

Jan Friewald: Reef check has 80 subtidal sites and surveys about 75 of them each year.

Sarah Sikich: In Santa Monica Bay, Heal the Bay surveyed 3,000 pier anglers for trends in targeted fish species, and provided multi-lingual outreach materials.

Amy Dean: The LiMPETS program has only nine staff but interacts with 4,000 students.

Peter Nelson: California Fisheries Research West projects funded: DFW hagfish research; collaborative socioeconomic study of the commercial halibut fishery; Paralabrax spp. mortality and population abundance; swordfish bycatch reduction and alternative gears; RCA research fishing for rockfish; lobster fishing data collection; biotoxins; and rockfish barotraumas.

Jay Chamberlain (for Aaron Robertson): There is an imbalance between what science calls for and what the public will tolerate.

Steve Wertz: We now have 124 MPAs containing 16% of state waters. DFW is conducting a risk/impact assessment, using modeling, for Scientific Collecting Permit applications within MPAs. E.g. Lovers Point SMR has 21 SCPs issued, but not all involve take. Along the shore of the Carmel Bay SMCA, the Pebble Beach golf course is eroding, and prevention remedies may impact the SMCA. Only one regulatory proposal change for the Central Coast MPAs has been received by the Commission since 2007- relates to kelp harvest within Año Nuevo SMCA.

Sam Cohen: Southern CA tribal interests were not involved in the MLPA process until it was too late. Along the North Coast, tribal exemption regulations were developed; the South Coast is now trying to do those after the fact. Tribal nations are willing to help with enforcement of MPAs.

Clare O'Reilly: Highlights of Ocean Protection Council funding: Kvittek mapping study, partnership with Ocean Science Trust, creation of MPA Monitoring Enterprise, creation of CFR West.

Lisa Wooninck: Monterey Bay National Marine Sanctuary office has invested \$2.5 million in programs directly related to Central Coast MPAs. Fracking is not allowed, since it would disturb the sea bed. Their extensive water quality monitoring program should be helpful.

She suggested that Advisory Bodies should be established for the regional management of MPA network components.

Cat Kuhlman: OPC will develop a Statewide MPA Network Governance and Implementation framework document. OPC has committed \$1-2 million for Central Coast MPA monitoring (she did not state for how long a period).

Tegan Hoffman: Five key elements for successful MPA implementation: 1) legal framework; 2) strong management plan; 3) operational capacity; 4) social capital, i.e. stakeholder trust, support, and engagement, including advisory bodies; 5) long-term financial sustainability. Belize and its Natural MPA network is a good example.

Charles Bonham: The theme is stewardship. DFW and our Marine Region are at a "pivot point"; we are "restructuring our marine world". We will double down on spatial planning.

Sonke Mastrup: The MLPA Master Plan was built for the design phase. We need to develop adaptive management for the MPAs. The MLPA Science Team model improved with each coastal region. We will have regional MPA management plans.

Jon Bishop: There are nine Regional Water Quality Control Boards. Most of the Areas of Special Biological Significance are within MPAs. Since the definition of point source discharge now includes runoff, there will be special provisions for allowing runoff within MPAs; the water quality in MPAs should reflect natural conditions. There are no intakes

within the ASBS. Their vast amount of water quality data needs to be merged with MPA data. The State Water Resources Control Board is developing a desalination policy

Mike Weber: Resources Legacy Foundation Fund coordinated philanthropic support for the MLPA process, but it cannot help with enforcement. There is no worldwide guide to MLPA implementation. The scope of planning for MPA monitoring is the next 4 years. Keys to continued success: 1) education of local District Attorneys; 2) long-term funding of the Monitoring Enterprising; 3) providing a structure for implementation.

Hawk Rosales: We need to be communicating directly with tribal leaders. It is better to approach them before a plan is in place. He wants to challenge those tribes with revenues from successful casinos to invest in resource conservation.

Sonke Mastrup: He used the concept of “cherry stemming” (a terrestrial term) for designing MPAs, with the example of drawing a boundary which excludes a public fishing pier. The MPA Management Plan needs metrics for success and triggers (like the Abalone Recovery Management Plan) for changes in biota or habitat, with possible consequences and an approach for the unexpected.

Charles Bonham: DFW now has a legal tribal advisor; we will likely develop one for the Marine Region. We need to develop a policy now for incompatible uses within MPAs.