

Final
Environmental Document
Marine Protected Areas
in NOAA's
Channel Islands National Marine Sanctuary
(Sections 27.82, 630, and 632 Title 14, California Code of Regulations)
Volume II



Photo Courtesy William Dewey, 1989



October 2002
State of California
The Resources Agency
Department of Fish and Game

Cover: An aerial view looking west at the northern Channel Islands. In the foreground is Anacapa Island then moving west is Santa Cruz, Santa Rosa, and San Miguel Islands. These islands, along with Santa Barbara Island to the south, form the National Oceanic and Atmospheric Association's Channel Islands National Marine Sanctuary (Sanctuary). The Sanctuary encompasses 1,252 square nautical miles from the mean high tide line to six nautical miles offshore these islands. State waters within the Sanctuary encompass 592 square nautical miles from the mean high tide line to three nautical miles offshore. Photo by Bill Dewey.

Final

2002 Environmental Document

Marine Protected Areas
in the
National Oceanic and Atmospheric Administration's
Channel Islands National Marine Sanctuary

Sections 27.82, 630, and 632 Title 14, California Code of Regulations

Volume II

by

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VOLUME II

Volume II contains the comments received on the Draft Environmental Document during the public review period and the Department's responses to those comments. The comments and responses comprise Chapter 8 of the Final Environmental Document. Volume II also contains Appendices 6 and 7 which were added as additional information that became available after the production of the Draft Environmental Document.

Chapter 8. RESPONSES TO COMMENTS REGARDING THE PROPOSED PROJECT

This chapter sets forth the California Department of Fish and Game=s (Department) responses to comments regarding the "Draft Environment Document, Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary," dated April 2002 (Draft ED). [See generally Cal. Code Regs., tit. 14, Section 781.5, subds. (c), (h); Pub. Resources Code, Section 21080.5, subd. (d)(2)(D)]. The Department, on behalf of the Fish and Game Commission (Commission) as the lead agency for the proposed project under the California Environmental Quality Act (CEQA) (Pub. Resources Code, Section 21000 et seq.), released the Draft ED for public review and comment on May 30, 2002.

The Department provided public notice of the availability of the Draft ED for public review and comment at the same time and made copies of the document available for review by interested public agencies and members of the public at a number of locations, including the Commission's office in Sacramento and Department offices in Sacramento, Redding, Yountville, Rancho Cordova, Fresno, Los Alamitos, San Diego, Santa Barbara, Morro Bay, Monterey, Menlo Park, Bodega Bay, Fort Bragg, and Eureka. The Department also submitted the Draft ED to the State Clearinghouse at the Governor's Office of Planning and Research, provided copies to County libraries in areas of the State that may be affected by the proposed project, and made the document available via the Department's Marine Region web site. Consistent with the notice of availability of the Draft ED, the Department and Commission accepted all written comments regarding the proposed project and Draft ED received before 5:00 p.m., on July 15, 2002, at the Commission's office in Sacramento or the Department's office in Santa Barbara. At the direction of the Commission, the Department extended the deadline for written public comments until September 1, 2002 and the Department and Commission accepted all written comments received before the close of business on that day. The Commission, in turn, solicited written and oral comments regarding the proposed project and Draft ED at a public hearing on August 1, 2002, in San Luis Obispo.

The responses to comments set forth below are intended to fulfill the Department's obligation to provide written responses to the Commission for all comments received during the public review and comment period regarding the proposed project and Draft ED. Consistent with the Commission's certified regulatory program, the Department's responses address all comments regarding the proposed project that provide recommendations to the Commission that are different from that of the Department. [Cal. Code Regs., tit. 14, Section 781.5, subd. (c)]. The responses below also address comments that raise significant environmental points regarding the Draft ED, and approval and implementation of the proposed project. [/d., subd. (h)]. The Department prepared the written responses that follow below guided by principles governing responses to comments under CEQA generally [See Pub. Resources Code, Section 21091, subd. (d); Cal. Code Regs., tit. 14, Section 15088].

8.1 List of Comments Received

A total of 2,492 letters, emails and oral comments were received by the Commission and Department relative to the draft Marine Protected Areas in NOAA=s Channel Islands National Marine Sanctuary Draft ED. Of this total, 2,445 were form letters that made identical comments. The Department prepared one response to the form letter (Response to Comment 6), and the form letter itself (E-03) can be found at page 8-79. Thirty nine letters and emails, 1 form email, and seven oral comments specifically commented on the Draft Environmental Document. The 39 letters and emails, 1 form email, and seven oral comments represented 221 Individual comments. One letter requested a change to the proposed regulations in the form of removing the proposal to reopen a portion of the Cowcod Conservation Area. Given recent Federal regulatory changes on the continental shelf, the Department agrees and has removed that portion of the proposal. The remaining letters either supported or opposed the proposed project or supported or opposed one or more of the proposed alternatives. A summary of all of the communications submitted is provided in Table 8-1. A copy of all the correspondence received can be found in Section 8.3.

Table 8-1. Comments received regarding the Draft Environmental Document and proposed regulation for Marine Protected Areas in NOAA=s Channel Islands National Marine Sanctuary.

Comment	Name	Date	Reference Number ¹	Summary of Comment
1	Joe Blaylock	6/2/2002	E-01-01	The Department has made non-public deals with the Nature Conservancy to police MPAs.
2	Joe Blaylock	6/2/2002	E-01-02	The Governor postponed the decisions until after October, 2002.
3	Joe Blaylock	6/2/2002	E-01-03	General opposition to MPAs
4	Dave Paden, Josh Paden	6/5/2002	E-02-01	Other methods of fisheries management, including size limits, bag limits, seasons, and gear restrictions, are more appropriate. MPAs are not necessary.
5	Dave Paden, Josh Paden	6/5/2002	E-02-02	Don=t increase fishing pressure on remaining open areas by complete closures. The comment contends that the result of increased pressure would lead to more closures.
6	Multiple Names, See Table 8-2	Multiple	E-03-01	General support for proposed project
7	Sean R. Hughes	6/12/2002	L-01-01	General opposition to MPAs
8	Sean R. Hughes	6/12/2002	L-01-02	Commercial fishing is responsible for the majority of fish taken and increase in take is due to improvement of commercial technology.
9	Sean R. Hughes	6/12/2002	L-01-03	The proposed project fails to address the "real problem," which the commenter apparently alleges is caused by over-fishing by commercials.
10	Jeff McMillan	6/17/2002	E-04-01	General support for Alternative 5, this alternative best achieves the national mandate to conserve biodiversity and establish sustainable fisheries.
11	Brian Adair	6/20/2002	E-05-01	General opposition to MPAs
12	Brian Adair	6/20/2002	E-05-02	The Department should consider the value of the sport dollar versus the commercial.
13	Jean-Michel Cousteau	6/20/2002	E-06-01	General support for Alternative 5
14	Gregory Falberg	6/20/2002	L-02-01	General support for the proposed project
15	James B. Ruch	6/21/2002	E-07-01	The proposal fails to consider a phased program with success demonstrated prior to completion.
16	James B. Ruch	6/21/2002	E-07-02	Scientifically predictable results of the proposed project are uncertain.
17	James B. Ruch	6/21/2002	E-07-03	Adequate funding is not available to manage, monitor, and report on MPAs in the proposed project
18	James B. Ruch	6/21/2002	E-07-04	The economic loss to recreational anglers would be too great for the local industry. This would have the greatest impact on anglers who rely on the sport fishing fleet for recreation.
19	James B. Ruch	6/21/2002	E-07-05	The is no environmental disaster occurring in the CINMS that the creation of MPAs would cure. Many tools, sizes, seasons, and limits will work very well to maintain and improve fisheries while providing for the continuation of both recreation and an economically sound

Comment	Name	Date	Reference Number ¹	Summary of Comment
				sport fishing industry.
20	James B. Ruch	6/21/2002	E-07-06	The document fails to consider a reasonable alternative of a limited, adaptive marine reserve process which would responsibly avoid unacceptable impact to the recreational sport fishing industry.
21	Keith McCoy	6/23/2002	E-08-01	Other management methods including "changing the size limit or limits... and support[ing] more fish hatcheries/habitat" should occur prior to any proposed closures.
22	Kimberly Selkoe	6/24/2002	E-09-01	General support for the proposed project
23	Randle M. Biddle	6/24/2002	E-10-01	General support for the proposed project
24	Cheryl Kohr	6/26/2002	E-11-01	General support for the proposed project
25	Dorothy Steinicke	6/27/2002	L-03-01	General support for the proposed project
26	Joanne R. Johnson	7/3/2002	E-12-01	General support for the proposed project
27	Kurt Lieber	7/3/2002	E-13-01	Support for a total ban on all fishing in 50% of California waters.
28	Kurt Lieber	7/3/2002	E-13-02	No driftnets, gillnets, seine nets or trawlers should be exempt from this total closure.
29	John J. Reynolds	7/3/2002	L-04-01	The commenter expresses support for the proposed project, but contends that the recommended network of reserves is "too small to adequately sustain marine resources" and that "only Alternative 5 is sufficient to achieve conservation of biological diversity and fisheries at the Channel Islands."
30	Pete Lafollette	7/5/2002	E-14-01	General support for Alternative 5
31	Brian Trautwein, Linda Krop	7/5/2002	L-05-01	General support for the proposed project
32	Brian Trautwein, Linda Krop	7/5/2002	L-05-02	The document could be improved by citing lack of peer-reviewed science predicting negative impacts of MPAs, as well as existing evidence suggesting that reserve establishment does not cause "congestion" impacts.
33	Brian Trautwein, Linda Krop	7/5/2002	L-05-03	The final document should list Alternative 5 as the preferred alternative.
34	Brian Trautwein, Linda Krop	7/5/2002	L-05-04	Alternative 5 provides the most significant benefit.
35	Brian Trautwein, Linda Krop	7/5/2002	L-05-05	The proposed project does not meet the conservation goals due to a lack of full habitat representation in all bioregions.
36	Brian Trautwein, Linda Krop	7/5/2002	L-05-06	The proposed project does not incorporate an insurance factor, nor do any alternatives except Alternative 5.
37	Brian Trautwein, Linda Krop	7/5/2002	L-05-07	The proposed project, Alternative 4, 5 and to a limited extent 3 have potential for connectivity.
38	Brian Trautwein, Linda Krop	7/5/2002	L-05-08	The proposed project, Alternative 4, and 5 allow potential monitoring using existing Kelp

Comment	Name	Date	Reference Number ¹	Summary of Comment
				Forest Monitoring sites.
39	Brian Trautwein, Linda Krop	7/5/2002	L-05-09	Alternative 5 best meets the goal of long-term sustainable fisheries while minimizing short-term economic impacts. The Science Advisory Panel already considered minimizing economic impacts in their recommendation and thus, in order to meet both goals an alternative must fall within their recommended range of 30-50%.
40	Brian Trautwein, Linda Krop	7/5/2002	L-05-10	More treatment should be given to the potential negative impacts of the no-project alternative and Alternatives 1,2 and 3.
41	T.K. Wang	7/6/2002	E-15-01	General support for the proposed project
42	Beatrice Simpson	7/8/2002	L-07-01	General support for the proposed project
43	Michon L. Washington	7/9/2002	L-06-01	The FAA has no comments at this time
44	Rich Holland	6/18/2002	E-16-01	The document assumes project-related socioeconomic impacts are negligible.
45	Rich Holland	6/18/2002	E-16-02	The document assumes MPAs will protect areas from oil spills.
46	Rich Holland	6/18/2002	E-16-03	The document is flawed because it puts marine reserves and commercial fishing ahead of the interests of recreational anglers.
47	Rich Holland	6/18/2002	E-16-04	The document does not address the problems of displaced effort or congestion of effort outside reserves.
48	Rich Holland	6/18/2002	E-16-05	The Marine Reserves Working Group Science Advisory Panel created their own mandate.
49	Deborah Koken	7/11/2002	E-17-01	General support for the proposed project
50	D.O. McIsaac	7/15/2002	L-08-01	Chapter 4 provides the appropriate baseline
51	D.O. McIsaac	7/15/2002	L-08-02	The document does not address the potential impact of status quo
52	D.O. McIsaac	7/15/2002	L-08-03	The rationale for rejecting the alternative to defer to the MLPA is not clear.
53	D.O. McIsaac	7/15/2002	L-08-04	The document does not address the problems of displaced effort in particular the potential habitat effects.
54	D.O. McIsaac	7/15/2002	L-08-05	Information on the specific level of effort and displacement is necessary to determine the relative impacts.
55	D.O. McIsaac	7/15/2002	L-08-06	The document's threshold of significance for habitat representation is not adequately explained.
56	D.O. McIsaac	7/15/2002	L-08-07	Beyond the Issue of size, the SSC notes that habitat representation is a fundamentally sound approach to determining which areas to place in reserves to protect biodiversity.
57	D.O. McIsaac	7/15/2002	L-08-08	The arguments for expected fisheries benefits (pp. 6-66, 6-67 and Figure 6-1) are technically weak and not compelling.

Comment	Name	Date	Reference Number ¹	Summary of Comment
58	D.O. McIsaac	7/15/2002	L-08-09	The SSC agrees 1996-1999 is a reasonable baseline period for commercial fisheries. The SSC agrees with the assessment that activities within the CINMS account for less than 1% of total income and employment in the seven county area of impact.
59	D.O. McIsaac	7/15/2002	L-08-10	The SSC request documentation be added to the Draft ED (or at least the SEA) regarding how consumer surplus estimates were derived.
60	D.O. McIsaac	7/15/2002	L-08-11	The SSC considers the estimates of profits for the party/charter sector quite reliable.
61	D.O. McIsaac	7/15/2002	L-08-12	It is not clear to the SSC why the value of fisheries at Tortugas should be a reasonable proxy for the value of fisheries at CINMS.
62	D.O. McIsaac	7/15/2002	L-08-13	In order to apply the results used to determine elasticities (0.04, 1.0, and 4.5) for potential increases in recreational quality, it is necessary to make unsubstantiated assumptions.
63	D.O. McIsaac	7/15/2002	L-08-14	The SSC expresses several reservations regarding the estimation of non-use values and the net benefits assessment found in Chapter 6 of the draft Environmental Document. They also suggest that the benefits and potential costs of monitoring, research, and management should be analyzed.
64	D.O. McIsaac	7/15/2002	L-08-15	The proposed project may have local benefits and, as part of a larger system, may help provide stock-wide benefits
65	D.O. McIsaac	7/15/2002	L-08-16	Substantially more scientific work is needed before proceeding.
66	D.O. McIsaac	7/15/2002	L-08-17	One impact may be displacement of effort into the albacore fishery.
67	D.O. McIsaac	7/15/2002	L-08-18	The document fails to consider the body of opinion that finds only theoretical basis for a 30-50% set aside.
68	D.O. McIsaac	7/15/2002	L-08-19	A minority of the advisors generally supports the proposed project.
69	Jay Elder	8/01/02	O-01-01	Asked the Commission to look at cumulative impacts of State and Federal actions on economics of other regulations as well as Marine Protected Areas.
70	Sal Valone	8/01/02	O-02-01	Sport fishing only takes 3 to 6% of the total compared to commercial. Fisheries like trawl should be eliminated and we wouldn't need closures. Traditional management including size limits and slot limits would be better.
71	Chris Miller	8/01/02	O-03-01	The commenter submitted several scientific papers that he felt supported Alternative 2 and the concept of holistic management.
72	Chris Hoeflinger	8/01/02	O-04-01	The commenter expressed concern for the disproportionate impact to individual fisheries, in particular the rock crab fishery.
73	David Nelson	8/01/02	O-05-01	Cape Canaveral experience shows that closed areas have very positive impact on recreational fishing.
74	Paul Weekland	8/01/02	O-06-01	Even though there is no fishing allowed for Abalone they haven't recovered. This is proof

Comment	Name	Date	Reference Number ¹	Summary of Comment
				that MPAs do not work.
75	Mike McGinnis	8/2/2002	E-18-01	The document fails to adequately represent the level of public support for a large network of no-take reserves.
76	Mike McGinnis	8/2/2002	E-18-02	More specific characterization of the importance of the nearshore marine environment of the study area should be developed in light of recent fishing closures, and the threat these closures pose to the marine life of the study area.
77	Mike McGinnis	8/2/2002	E-18-03	General support for Alternative 5
78	Mike McGinnis	8/2/2002	E-18-04	The proposed project cannot protect kelp ecosystems in the California and Oregonian biogeographic provinces.
79	Mike McGinnis	8/2/2002	E-18-05	High quality habitats are not included in the proposed project. Some of these habitats may be cut by the Department to support the short-term interests of commercial and sports fishing industries.
80	Mike McGinnis	8/2/2002	E-18-06	It makes sense to first implement MPAs at the Channel Islands and then continue with the rest of the Southern California Bight. That is, in fact, phasing in of MPAs.
81	Mike McGinnis	8/2/2002	E-18-07	Additional kelp forest habitat should be included.
82	Michon L. Washington	8/2/2002	L-09-01	Licensed launches from the California Spaceport are not mentioned in the Draft ED and may affect the commercial launch industry.
83	Mike Villano	8/8/2002	E-19-01	Appears to advocate a "No Action" alternative in favor of recreational fishermen.
84	Diane Pleschner-Steele	8/8/2002	L-10-01	The document provides inadequate information on the impacts of status quo
85	Diane Pleschner-Steele	8/8/2002	L-10-02	The goals and objectives for individual sites are not provided, nor a discussion of why the overlap map was enlarged.
86	Diane Pleschner-Steele	8/8/2002	L-10-03	In order to fully evaluate the costs and benefits of proposed networks the entire State process should proceed at the same time.
87	Diane Pleschner-Steele	8/8/2002	L-10-04	The document does not adequately discuss the potential impacts of effort displacement
88	Diane Pleschner-Steele	8/8/2002	L-10-05	The documents threshold of significance for habitat representation is not adequately explained.
89	Diane Pleschner-Steele	8/8/2002	L-10-06	The document fails to address the concerns of scientists who disagree that MPAs are the only cure for perceived ills, particularly those related to fishery management.
90	Diane Pleschner-Steele	8/8/2002	L-10-07	Constituent involvement in MPA planning is essential.
91	Diane Pleschner-Steele	8/8/2002	L-10-08	Asserts that MPAs are a valuable tool are disputed by most fisheries scientists.
92	Diane Pleschner-Steele	8/8/2002	L-10-09	Marine reserves will do little toward achieving optimum yield for epipelagic and migratory species.

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93	Diane Pleschner-Steele	8/8/2002	L-10-10	A single percentage set aside will not work in all cases.
94	Diane Pleschner-Steele	8/8/2002	L-10-11	Dense populations within reserves do not necessarily lead to increased catches in surrounding waters.
95	Diane Pleschner-Steele	8/8/2002	L-10-12	Existing reserves and those proposed have been established without baseline studies.
96	Diane Pleschner-Steele	8/8/2002	L-10-13	Management may need to include a variety of options including selective fishing.
97	Diane Pleschner-Steele	8/8/2002	L-10-14	The Primary emphasis should be on protection of valuable and vulnerable areas, rather than on achievement of a percentage goal for any given region.
98	Diane Pleschner-Steele	8/8/2002	L-10-15	The potential economic and ecological benefits of marine reserves will not be realized without a sufficient commitment to enforcement and monitoring.
99	Diane Pleschner-Steele	8/8/2002	L-10-16	The SSC considers the choice of reserve size to be a policy decision.
100	Diane Pleschner-Steele	8/8/2002	L-10-17	Substantial fisheries benefits on a stock-wide scale are unlikely to result under any MPA alternative.
101	Diane Pleschner-Steele	8/8/2002	L-10-18	It is not possible to draw any conclusions regarding the relative costs and benefits of marine reserves.
102	Diane Pleschner-Steele	8/8/2002	L-10-19	The new defacto reserve established through groundfish closures must be considered.
103	Diane Pleschner-Steele	8/8/2002	L-10-20	Reserves do not address the prospect of sea otter emigration into southern California.
104	Chris Hoeflinger	8/18/2002	L-11-01	The Department has segmented the project in violation of CEQA sec. 15165. The implementation of the MLPA is foreseeable and should have been the full project reviewed in the draft Document.
105	Chris Hoeflinger	8/18/2002	L-11-02	Due to lack of public participation and oversight in designing the DFG/CINMS preferred alternative, it is difficult to understand what specific goals have been achieved.
106	Chris Hoeflinger	8/18/2002	L-11-03	The congestion resulting from displaced effort into areas immediately outside and adjacent to MPAs will result in an adverse environmental impact.
107	Chris Hoeflinger	8/18/2002	L-11-04	The draft Environmental Document does not include the MLPA, cowcod, or shelf closures in its future or past projects list.
108	Chris Hoeflinger	8/18/2002	L-11-05	The document does not mention the current array of Fisheries management measures and makes no mention of abundant stocks.
109	Chris Hoeflinger	8/18/2002	L-11-06	The document fails to adequately consider the No-Action alternative.
110	Chris Hoeflinger	8/18/2002	L-11-07	The Draft ED does not propose adequate monitoring. It does not propose adequate pre-project monitoring and must include a detailed monitoring Plan.
111	Chris Hoeflinger	8/18/2002	L-11-08	The draft Environmental Document does not adequately propose mitigation for individual fisheries impacted by the proposed project particularly the red crab fishery.

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112	Chris Hoeflinger	8/18/2002	L-11-09	The proposed project Draft ED makes numerous assumptions on reserve theory, which are not supported by substantial evidence in the record. The Science Advisory Panel concluded that large closures would be effective in the CINMS because large closures were effective elsewhere.
113	Chris Hoeflinger	8/18/2002	L-11-10	The Department is using a percentage based approach to determine reserve size.
114	Chris Hoeflinger	8/18/2002	L-11-11	The Science Advisory Panel used habitat as a proxy for species distribution, this resulted in hidden environmental and economic impacts due to the actual distribution and concentration of species being much more compressed than assumed.
115	Chris Hoeflinger	8/18/2002	L-11-12	The Science Advisory Panel concluded that three separate biogeographic regions are contained within the project area. None of the 119 species emanates from or exhibits characteristics unique to the transition region. By substituting biogeographic region for species range, the number of MPAs is unnecessarily increased.
116	Chris Hoeflinger	8/18/2002	L-11-13	The Science Advisory Panel incorrectly concluded that 119 species were in need of and would receive additional protection from MPAs. 57 of these species are fully protected and of the remaining 62 only 33 are not shelf or nearshore rockfish.
117	Chris Hoeflinger	8/18/2002	L-11-14	The Science Advisory Panel assumed that fishery management at the CINMS is poor or nonexistent.
118	Chris Hoeflinger	8/18/2002	L-11-15	The generally accepted range of percentage for reserve size is as follows: a) monitoring reserves 1-10%, b) Added precaution in fishery management 10-20%, c) Alternative fishery management and stock rebuilding 20-50%. In light of groundfish closures, stock rebuilding appears unnecessary and redundant.
119	Chris Hoeflinger	8/18/2002	L-11-16	The draft Environmental Document fails to consider an alternative that meets the requirements of the MLPA with representative habitat as the objective.
120	Chris Hoeflinger	8/18/2002	L-11-17	General support for Alternative 6
121	James P. Burgess, III	8/29/2002	L-12-01	General support for the proposed project
122	James P. Burgess, III	8/29/2002	L-12-02	The final document should acknowledge new management measures for rockfish that have occurred or may occur.
123	James P. Burgess, III	8/29/2002	L-12-03	The proposal to reopen a portion of the Cowcod Conservation Area may no longer be consistent with rockfish management.
124	James P. Burgess, III	8/29/2002	L-12-04	Another resource management concern is the lack of protection of seabirds in critical breeding and roosting areas.
125	James P. Burgess, III	8/29/2002	L-12-05	The final document should discuss existing and/or planned biological and economic monitoring and plans for enforcement.

Comment	Name	Date	Reference Number ¹	Summary of Comment
126	Chris Miller	8/30/2002	L-13-01	The final document should include more detailed discussion of how MPAs will be integrated into fisheries management.
127	Chris Miller	8/30/2002	L-13-02	The project is inappropriately segmented in the analysis. It does not give adequate attention to the cumulative impacts of the MLPA.
128	Chris Miller	8/30/2002	L-13-03	The proposed project should be implemented as a pilot or test case.
129	Chris Miller	8/30/2002	L-13-04	The document does not reference any scientific papers that deal with the problems of congestion of fishing effort or zonal management. There are no resources cited in support of social geography, cartography, anthropology, community-based management, societal and ethical values, etc.
130	Chris Miller	8/30/2002	L-13-05	The document fails to analyze CalCOFI larval survey data to explain source and sink populations.
131	Chris Miller	8/30/2002	L-13-06	The document inadequately discusses the ecological science framework and tradeoffs of designing marine reserves to protect species at the edge of their ranges.
132	Chris Miller	8/30/2002	L-13-07	The document does not provide detail on long term monitoring plans.
133	Chris Miller	8/30/2002	L-13-08	The document ignores the NRC Report's findings that quality habitat should be set aside as opposed to a pre-determined percentage goal.
134	Chris Miller	8/30/2002	L-13-09	The Proactive Fishermen's Plan (Alternative 2) selects the best quality areas for no-take MPAs.
135	Chris Miller	8/30/2002	L-13-10	The document should analyze whether existing fisheries management is adequate to protect the species of interest.
136	Chris Miller	8/30/2002	L-13-11	The species of concern list was not a consensus product of the MRWG and was developed by the Sanctuary and Department.
137	Chris Miller	8/30/2002	L-13-12	What negative impacts on fishery stocks and habitat are a consequence of squeezing the same number of fishermen into (for the preferred alternative) 75% of the fishing space?
138	Chris Miller	8/30/2002	L-13-13	The document does not consider the impacts of individual areas on displacement of the lobster fishery particularly on the North side of Anacapa Island and the Northeast side of Santa Cruz Island.
139	Chris Miller	8/30/2002	L-13-14	The proposed project disproportionately impacts the red crab fishery.
140	Chris Miller	8/30/2002	L-13-15	The proposed project closes a significant portion of the kelp beds, thus disproportionately impacting sea urchin fishermen.
141	Chris Miller	8/30/2002	L-13-16	The proposed project would restrict white seabass and halibut fishing by an additional 25% without mitigation.
142	Chris Miller	8/30/2002	L-13-17	The document does not discuss the prospect of increased foreign competition for market

Comment	Name	Date	Reference Number ¹	Summary of Comment
				share and potential cumulative impacts to marine resources as a result of accelerating competition and transfer of effort to another region of the same ecosystem, the California Bight in Mexican waters.
143	Chris Miller	8/30/2002	L-13-18	The Draft ED fails to provide "management context" under CEQA for Project Alternatives, which "masks" significant environmental impacts.
144	Chris Miller	8/30/2002	L-13-19	The final document should discuss what biological performance standards will be used to measure performance.
145	Chris Miller	8/30/2002	L-13-20	The proposed project does not consider the relative scale of reserve size compared to island size and use patterns.
146	Chris Miller	8/30/2002	L-13-21	The document fails to consider the relative heterogeneity of ecological features within reserves.
147	Chris Miller	8/30/2002	L-13-22	A variety of options for phasing are provided by the commenter and should be presented in the final document.
148	Doug Obegi	8/31/2002	L-14-01	General support for the proposed project
149	Doug Obegi	8/31/2002	L-14-02	The document is legally sufficient under CEQA
150	Doug Obegi	8/31/2002	L-14-03	The document does not sufficiently describe the potential impacts of alternative 6 (defer to MLPA) and 7 (no action).
151	Doug Obegi	8/31/2002	L-14-04	A more thorough treatment of the environmental effects of the project is desirable.
152	Doug Obegi	8/31/2002	L-14-05	The executive summary should more extensively analyze each alternative with respect to the ecological criteria in Section 5.3.1. Table E-1 should be revised to show the potential negative impacts of no action or deferring to the MLPA.
153	Doug Obegi	8/31/2002	L-14-06	More detail should be provided on how deferring to the MLPA will not meet the goals or objectives of the proposed project.
154	Doug Obegi	8/31/2002	L-14-07	Taking no action and deferring to the MLPA are substantively the same and should be combined as a single alternative.
155	Doug Obegi	8/31/2002	L-14-08	The Department is correct in its assertion of no significant environmental impacts
156	Doug Obegi	8/31/2002	L-14-9	Section 5.3 should be reorganized to make it clearer that parts are the ecological criteria used to draft the proposed project and parts are an analysis of how the proposed project meets those criteria.
157	Doug Obegi	8/31/2002	L-14-10	The criteria for habitat representation comparisons on 5-12 should be more completely explained.
158	Doug Obegi	8/31/2002	L-14-11	A table or set of tables comparing the habitat representation of each alternative within each biogeographical region and each habitat type would be helpful.

Comment	Name	Date	Reference Number ¹	Summary of Comment
159	Doug Obegi	8/31/2002	L-14-12	The final document should include analysis of how each alternative meets the criteria of including existing monitoring sites as well as information on the level of existing monitoring.
160	Doug Obegi	8/31/2002	L-14-13	The final document should include information on why each alternative does or does not include a multiplier to insure against catastrophes.
161	Doug Obegi	8/31/2002	L-14-14	The final document should include a summary table describing the analysis with respect to ecological criteria.
162	Doug Obegi	8/31/2002	L-14-15	The final document should include a discussion of why impacts of congestion of effort would not be significant under CEQA.
163	Doug Obegi	8/31/2002	L-14-16	Where possible the final document should evaluate environmental benefits of the proposed project and alternatives.
164	Doug Obegi	8/31/2002	L-14-17	Other fisheries management activities, including the recent groundfish closures, should be included in the discussion of cumulative impacts.
165	Doug Obegi	8/31/2002	L-14-18	The document should be edited by moving information on FMPs to a section discussing the impacts of other fisheries management activities.
166	Doug Obegi	8/31/2002	L-14-19	If the document's discussion of economic impacts is edited it should still contain qualitative analyses of long term costs and benefits of the proposed project
167	Rod Fujita, Richard Charter	9/3/2002	L-15-01	The Fish and Game Commission has clear authority to establish MPAs
168	Rod Fujita, Richard Charter	9/3/2002	L-15-02	The final document should fully comply with the federal Endangered Species Act, including provisions of Section 7 consultations.
169	Rod Fujita, Richard Charter	9/3/2002	L-15-03	The proposed project best accomplishes the established goals while minimizing consumptive user impacts.
170	Rod Fujita, Richard Charter	9/3/2002	L-15-04	The proposed project was specifically sized and located to avoid high use areas while maintaining habitat representation.
171	Rod Fujita, Richard Charter	9/3/2002	L-15-05	Due to the recent shelf closures the short term economic costs are dramatically overstated and the long term benefits understated in the document.
172	Rod Fujita, Richard Charter	9/3/2002	L-15-06	The no project alternative would not meet the project goals and would have negative impacts.
173	Rod Fujita, Richard Charter	9/3/2002	L-15-07	The defer decision alternative is unacceptable as it would allow continued declines in resources.
174	Marina Cazorla	9/3/2002	L-16-01	No coastal development permit will be required for the proposed project.
175	Marina Cazorla	9/3/2002	L-16-02	General support for Alternative 5. Only Alternative 5 meets the Science Advisory Panels recommendations for reserve size. Alternative 5 would protect the largest area and the greatest number of different habitats. Alternative 5 is the only alternative that includes an

Comment	Name	Date	Reference Number ¹	Summary of Comment
				insurance factor as recommended by the Science Advisory Panel.
176	Marina Cazorla	9/3/2002	L-16-03	The Department should include discussion of new groundfish regulations including a re-assessment of potential socio-economic impacts which would likely decrease.
177	Marina Cazorla	9/3/2002	L-16-04	The document should clarify the Coastal Commission jurisdiction.
178	Marina Cazorla	9/3/2002	L-16-05	The document should expand the discussion of the Southern sea otter and include the most recent population data.
179	Marina Cazorla	9/3/2002	L-16-06	The environmental impacts of existing commercial fishing should be discussed along with the potential benefits of marine reserves.
180	Marina Cazorla	9/3/2002	L-16-7	The economic overview of commercial fishing should be revised based on the new groundfish regulations.
181	Marina Cazorla	9/3/2002	L-16-8	The document's discussion of Oil and Gas should be expanded and include recent proposals to expand extended reach drilling and discussions of potential impacts of spills.
182	Marina Cazorla	9/3/2002	L-16-9	The information on passive use benefits should be expanded.
183	Harry Liquornik	9/3/2002	L-17-01	It is questionable if there was adequate community involvement to include Santa Barbara Island in the range of alternatives, it is primarily fishery from the Los Angeles and Ventura regions and there were no community meetings held in the Los Angeles region.
184	Harry Liquornik	9/3/2002	L-17-02	The range of alternatives is inadequate because the lower end of the scope has large reserves in the western portion of the project area and little to no reserve area in the Eastern portion.
185	Harry Liquornik	9/3/2002	L-17-03	Why does the Department use Alternative 1, the areas of overlap as the lower end of the range?
186	Harry Liquornik	9/3/2002	L-17-04	No action was taken by the Department or Commission to address a request to change Alternatives 1 or 3 due to disproportionate impacts to Santa Barbara harbor and their failure to protect habitat in all three bioregions.
187	Harry Liquornik	9/3/2002	L-17-05	The document should address potential negative impacts of displaced consumptive activities. How does the Department propose to follow the Science Advisory Panel recommendation that effort should not increase in the remaining open areas?
188	Harry Liquornik	9/3/2002	L-17-06	The document does not discuss fish behavior and mobility in relation to residence time within a marine reserve and how this will affect the benefits of marine reserves on different species.
189	Harry Liquornik	9/3/2002	L-17-07	The document should list or rank local species that may or may not receive benefits from marine reserves. Local fish behavior and movement patterns should be cited and a ranking of benefits from spillover developed.

Comment	Name	Date	Reference Number ¹	Summary of Comment
190	Harry Liquornik	9/3/2002	L-17-08	How did the Department determine levels of significance for economic impacts in developing the proposed project?
191	Harry Liquornik	9/3/2002	L-17-09	The Draft ED should note the potential area closures under the Endangered Species Act for threatened bird populations. All areas that may be considered for closure should be identified to address potential cumulative impacts.
192	Harry Liquornik	9/3/2002	L-17-10	No community or MRWG meetings were held in the Los Angeles region to allow adequate community input for this region.
193	Harry Liquornik	9/3/2002	L-17-11	The Scorpion Anchorage site, coupled with Painted Cave, will lead to excessive displacement of squid and lobster fishing.
194	Harry Liquornik	9/3/2002	L-17-12	What is the Department's rationale and biological benefits for creating a recreational take only site at Painted Cave when specific congestion concerns were raised from the commercial sector.
195	Harry Liquornik	9/3/2002	L-17-13	Concerns were raised regarding displacement and impacts to prawn trap fishing and pelagic fishing at Gull Island as well as enforcement issues with the northwest boundary.
196	Harry Liquornik	9/3/2002	L-17-14	Concerns were raised regarding gill net fisheries outside one nautical mile in the Carrington Point site. The halibut and white sea bass fisheries analysis should be gear, rather than species specific.
197	Harry Liquornik	9/3/2002	L-17-15	The Skunk Point site coupled with Carrington Point will lead to excessive displacement and congestion of the crab and halibut fisheries.
198	Harry Liquornik	9/3/2002	L-17-16	How does the Department propose to deal with displaced effort from the crab fishery?
199	Harry Liquornik	9/3/2002	L-17-17	What is the Department's rationale for including more than 90% of the North facing habitat of San Miguel Island?
200	Harry Liquornik	9/3/2002	L-17-18	The proposed project moves the western boundary of the South Point SMR one mile west from where it was originally drawn in the public process. What is the Department's rationale for moving the western boundary at South Point, Santa Rosa Island?
201	Harry Liquornik	9/3/2002	L-17-19	What is the rationale for including two alternatives (1 and 3) that have the majority of reserve habitat representation in the Oregonian and Transition province and have a disproportionate impact to Santa Barbara Harbor?
202	Harry Liquornik	9/3/2002	L-17-20	Why does the document include alternatives that have boundaries that are confusing and difficult to enforce?
203	Harry Liquornik	9/3/2002	L-17-21	How did the Department determine it's preference to establish a network with lower economic impacts than alternatives 4 and 5.
204	Harry Liquornik	9/3/2002	L-17-22	The document fails to recognize the phasing sub options of Alternative 2 as well as the recommendation to include Santa Barbara Island in the MLPA process.

Comment	Name	Date	Reference Number ¹	Summary of Comment
205	Harry Liquornik	9/3/2002	L-17-23	The document and proposed project do not include any additional monitoring plans that will contribute to future decisions. How do the lead agencies propose to gather economic and biological data for use in future decisions such as the MLPA?
206	Harry Liquornik	9/3/2002	L-17-24	How does the Department propose to address fleet reduction for fisheries that are fully exploited, overcapitalized, displacement and congestion from the establishment of MPAs?
207	Harry Liquornik	9/3/2002	L-17-25	Short term harvest reductions on top of area closures with out proper overall fleet reduction combined with the proposed project will lead to excessive congestion, over fishing and unsustainable fisheries. The document does not adequately discuss the potential impacts of congestion of effort. Cite any local or regional studies of marine reserves for spillover benefits for offsetting congestion.
208	Harry Liquornik	9/3/2002	L-17-26	The document should explain what additional information would be required to allow proper socioeconomic analysis under the Regulatory Flexibility Act. How do the lead agencies propose to determine if there would or would not be significant impacts under the Regulatory Flexibility Act, RIR, and NEPA for the Federal phase of the proposed project?
209	Harry Liquornik	9/3/2002	L-17-27	The statement that "little is know about the distribution of hard sediments on the deep continental shelf and slope in the Sanctuary" is not made in the Habitat Representation section for the proposed project.
210	Harry Liquornik	9/3/2002	L-17-28	It should be noted that fisheries dependent on kelp availability may experience additional congestion from additional loss of fishing grounds due to limited kelp abundance during El Niño or other events.
211	Jim Curland	9/3/2002	L-18-01	The proposed project is the minimum protection necessary.
212	Jim Curland	9/3/2002	L-18-02	General support for Alternative 5
213	Jim Curland	9/3/2002	L-18-03	We do not believe the Project fulfills the biodiversity goal and other key MLPA mandates to appropriately balance long-term interests with short-term impacts.
214	Jim Curland	9/3/2002	L-18-04	The Project does not adequately address the MRWGs Ecosystem Biodiversity Goal.
215	Jim Curland	9/3/2002	L-18-05	The proposed project does not incorporate an insurance factor in order to protect against catastrophic events.
216	Jim Curland	9/3/2002	L-18-06	There is inadequate representation of kelp forest habitats in both the proposed project (21%) and Alternative 5 (24%), this habitat should be represented at closer to 30-50%.
217	Jim Curland	9/3/2002	L-18-07	It is unclear what is meant by the last two comments in section 2.7, Areas of Concern, regarding environmental allocation and conflicts among user groups.
218	Jim Curland	9/3/2002	L-18-08	The Fish and wildlife service is the agency that is responsible for the implementation of ESA as it pertains to sea otters.

Comment	Name	Date	Reference Number ¹	Summary of Comment
219	Jim Curland	9/3/2002	L-18-09	The southern sea otter is listed as "threatened" not "endangered" under the Federal ESA.
220	Mark Rauscher	9/3/2002	L-19-01	Feeding of marine wildlife for the purposes of viewing, and other forms of wildlife harassment, needs to be better addressed in developing management plans for Marine Protected Areas within the Channel Islands National Marine Sanctuary.
221	Mark Becker	9/11/2002	O-07-01	The proposal should require the use of specific electronic equipment when fishing in the region. This would make enforcement of and navigation around boundaries simpler and boundary violations easier to prosecute.

¹E = Electronic, L=Written Letters, O=Oral

8.2 Department Response to Comments

Abbreviations Used in Responses

CEQA - California Environmental Quality Act
CINMS - Channel Islands National Marine Sanctuary
Draft ED - Draft Environment Document
ED - Environment Document
ESA - Endangered Species Act
Final ED - Final Environmental Document
FMP - Fishery Management Plan
MLMA - Marine Life Management Act
MLPA - Marine Life Protection Act
MOUs - Memoranda of Understanding
MPAs - Marine Protected Areas
MRWG - Marine Reserves Working Group
NEPA - National Environmental Policy Act
NOAA - National Oceanic and Atmospheric Administration
NPS - National Park Service
NRC - National Research Council
PFMC - Pacific Fishery Management Council
RFA - Regulatory Flexibility Act
RIR - Regulatory Impact Review
SAC - Sanctuary Advisory Council to the Channel Islands National Marine Sanctuary
SAP - Science Advisory Panel to the Marine Reserves Working Group
SSC - Science and Statistics Committee of the Pacific Fishery Management Council

Comment 1: The Department has made non-public deals with the Nature Conservancy to police MPAs.

Response 1: The Department disagrees. Enforcement for MPAs will be provided by Department enforcement staff along with other public agencies that have established Memoranda of Understanding. Certain of these agencies also provide funding through the MOUs. These agencies include the Channel Islands National Marine Sanctuary, Channel Islands National Park, NOAA Fisheries, and United States Coast Guard. The joint enforcement plans and MOUs were discussed during public MRWG and SAC meetings and by the SAC's enforcement subcommittee.

Comment 2: The Governor postponed the decisions until after October, 2002.

Response 2: The Department disagrees. The Fish and Game Commission initially moved the adoption date to December 2002 in order to facilitate comment from the Pacific Fishery Management Council. The Commission subsequently moved the adoption date back to October, 2002.

Comment 3: Expressed general opposition to MPAs.

Response 3: Comment noted.

Comment 4: Favors other methods of fisheries management, including closure of certain areas to commercial fishing, size limits, bag limits, seasonal restrictions, and gear restrictions. Asserts that MPAs are not necessary.

Response 4: The Department disagrees. In enacting the MLMA in 1998, the Legislature identified objectives that facilitate the primary fishery management goal of sustainability to include the maintenance, restoration and enhancement of marine fishery habitat, but also expressly identified other conservation and management measures. In enacting the MLPA in 1999, the Legislature expressly recognized that MPAs and sound fishery management are complementary components of a comprehensive effort to sustain marine habitats and fisheries. MPAs are considered one of many tools available to fisheries managers and are not the only tool used in the project area. However, certain ecosystem functions of MPAs can not be provided by other management measures. For example, size, season, and bag limits, do not prevent bycatch of non-target species or undersized individuals nor do they fully provide for natural predator and prey interactions. It is clear that traditional management measures alone have not been sufficient to protect groundfish and other populations. Incidental impacts of various fishing practices may also have unintended effects that would not occur in an MPA, particularly a no-take reserve. This includes both direct impacts to the environment (e.g., damage to a reef from trawling) and indirect ecosystem impacts (e.g., removing all large, old individuals and altering the size composition). MPAs by their nature provide for undisturbed habitats and act as "natural hatcheries". These facts lead to benefits in total production and export of young. The Department believes MPAs are an important and necessary component of the proposed project.

In addition to fisheries-related goals, the proposed project is intended to address ecological goals including representing habitats and species for their intrinsic values. MPAs provide insurance for management uncertainty by providing areas where species can interact in a relatively undisturbed ecosystem. The proposed project contemplates the coordination of MPAs with other management measures to complete the regulatory framework (see Draft ED at page E-3). Fisheries management issues involving specific measures are more appropriately addressed through the FMP process. The Draft ED recognizes that MPAs should be coordinated with fisheries management and discusses how fisheries management activities will compliment MPAs on page 5-18. The proposed project attempts to address a specific set of goals and objectives, including, but not limited to, objectives to help sustain fisheries. The specific integration of MPAs into fisheries management, including reductions in overall fleet capacity, total allowable catch, and allocation between user groups is more appropriately dealt with through the FMP process. FMPs are the tool used to establish these limits. The Nearshore FMP, for example, includes the use of MPAs in the management strategy.

Comment 5: The comment requests that the Department not increase fishing pressure on remaining open areas by complete closures and suggests the result of increased pressure would lead to more closures.

Response 5: The potential impacts of congestion in general are described in the Draft ED at pages 5-17 through 5-18, and within the proposed project on page 5-31. This discussion indicates that, although certain activities will be displaced spatially by MPAs, the level of displacement is relatively low, with any added pressure outweighed by expected benefits to the fishery. These benefits would include more sustainable resources in the long-term as well as potential increases in catch due to added production from within MPAs. The key question regarding congestion is whether the expected increase in export from reserves can compensate for the increased fishing pressure in non-reserve areas. If it does, fishery yields will show a net increase or remain the same despite the displaced effort. If congestion leads to a negative habitat impact, populations on the borders of reserves would be expected to show an equivalent decline. As described in the Final ED on page 5-18, the comprehensive reviews of reserves by Halpern (2002) and Palumbi (2002) suggest that production increases inside reserves are considerably larger than expected increases in take outside reserves. In the case of the proposed project, 100% of the effort would be limited to approximately 81% of the area (with a 19% closure). The empirical data in these studies suggest that enhanced production within reserves can more than compensate for the effects of congestion outside for reserve areas as high as 50%. These conclusions are supported by empirical data outside reserves. Studies consistently show increases in abundance immediately outside reserves that would not occur if habitat impacts were negative (e.g., Roberts et al. 2001; Stevens and Sulak 2002; Murawski et al. 2000; McClanahan and Kaunda-Arara 1996; Ratikin and Kramer 1996; and Russ and Alcala 1996b).

The MLPA, with which the proposed project must be consistent, expressly requires the Department, in evaluating proposed projects with potential adverse impacts, to highlight those impacts and to recommend measures to avoid or fully mitigate any impacts that are inconsistent with MLPA goals and guidelines, or the objectives of the MPA. Thus, the MLPA itself provides additional safeguards against the proposed project having significant adverse environmental impacts. As a result of this evaluation, the Department concluded that no such significant adverse impacts will result from the proposed project. Further, although the phenomenon of congestion has been determined not to rise to the level of a significant impact, the Department notes that the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. This would not be limited to creation, modification, or removal of MPAs and could include measures such as reduced allowable catch, increased size limits, seasonal closures, etc.

The proposed project is not deficient because it does not provide economic mitigation for impacted commercial fisheries. The concept of "mitigation" referenced in the Draft ED is in relation to environmental impacts to the resource itself, not to the

socioeconomic activities related to the resource. Because no project-related significant effects are expected, mitigation measures are unnecessary under CEQA. Indeed, economic and social effects of a project are not environmental impacts per se for purposes of CEQA. Accordingly, no economic mitigation to impacted fisheries is required. Additional discussion of the role of socioeconomic analysis in the Draft ED may be found in the Response to Comment 12.

Comment 6: Expresses general support for the proposed project.

Response 6: Comment noted.

Comment 7: Expresses general opposition to MPAs.

Response 7: Comment noted.

Comment 8: Commercial fishing is responsible for the majority of fish taken, as compared to recreational anglers, and the increase in commercial take is due to recent improvements in commercial technology.

Response 8: The Department disagrees. While it is true that commercial fishing takes the majority of fish (by number and weight) of all species combined, recreational anglers also have an impact. The breakdown of catch is, in fact, much more even when looking at individual species, especially in the nearshore environment. For instance, recreational anglers take approximately 60% of all nearshore finfish (based on average landings 1994-1998). In addition, recreational anglers tend to target larger *Atrophy®* fish that can provide significantly more reproductive potential to a population. While commercial fishing technology has contributed to increased efficiency, other technology has also increased the recreational angler=s ability to target specific areas repeatedly, including advances in navigational equipment such as Global Position System and RADAR.

Comment 9: The proposed project fails to address the "real problem," which the commenter apparently alleges is caused by over-fishing by commercials.

Response 9: The Department disagrees. The goals of the project address resource issues from an ecological and whole ecosystem perspective and are not focused at any particular user group. Current environmental impacts associated with commercial fishing would be reduced by the proposed project through complete closure of certain areas of critical habitats. The proposed project is not limited to regulations on recreational anglers. In fact, in two areas the project proposes allowing recreational take while prohibiting commercial take. See also Response to Comment 8 regarding relative take by various user groups.

Comment 10: The commenter expresses general support for Alternative 5 and states that this alternative best achieves the national mandate to conserve biodiversity and establish sustainable fisheries.

Response 10: The Department disagrees that Alternative 5 best achieves the national mandate to conserve biodiversity and establish sustainable fisheries. While none of the MPA network alternatives (the proposed project and Alternatives 1 through 5) is expected to have negative impacts on the environment, the proposed project proposes the highest number of habitats at a level of 20% or more. The SAP recommendation to include at least 30% of all habitats had to be integrated with other MPA scientific and resource-user considerations to achieve the most feasible alternative. Alternative 5 is the only alternative that exceeds the SAP's minimum recommendation for total area, but it does a poorer job of representing individual habitats. Alternative 5 only

represents 11 of the 17 habitats at a level of 20% or more of which 5 are represented at 30% or more. While Alternative 5 is the only alternative that incorporates an "insurance factor", this does not mean Alternative 5 environmentally superior because, among other reasons, the distribution of MPAs in multiple areas around the islands inherently limits the impacts of single events on all reserves at once (See Draft ED at p. 5-31). Various mechanisms to reduce the chance of tanker collisions (e.g. vessel traffic separation) and to mitigate oil spills (e.g. spill response plans) also already exist and provide additional insurance.

Conversely, while the proposed project is not the largest in overall area, it provides representation to the highest number of habitats at a level of 20% or more of all the alternatives. The proposed project represents 12 of 17 habitats used by the SAP for comparison of alternatives at a level of 20% or more, of which 5 are represented at 30% or more. The project also seeks to minimize short-term socioeconomic impacts while maintaining an ecologically viable network. By effectively including more heterogeneous habitats, the proposed project reduces the overall area subject to the proposed MPAs and therefore achieves the goal of minimizing economic impacts to a greater extent than Alternative 5. Finally, the proposed project is intended to function along with other management strategies to provide for sustainable resources. The proposed project has a higher ratio of habitat representation per dollar impact than Alternative 5 and thus is better at minimizing cost while maximizing habitat representation (a proxy for protecting species) (See Draft ED Table 6-69 at p. 6-69). Thus, using the same bases of habitat representation as a proxy for protection of species used by the SAP, the proposed project is actually more likely to achieve conservation of biological diversity and promotion of sustainable fisheries than other alternatives. While the Department believes that the proposed project best meets all the goals, including both ecological and economic objectives, and best represents habitats, the Commission will ultimately decide whether to adopt the proposed project or some other alternative.

Comment 11: Expresses general opposition to MPAs.

Response 11: Comment noted.

Comment 12: The Department should consider the value of the sport dollar versus the commercial.

Response 12: The Department prepared a detailed economic impact analysis as part of the planning process for the proposed project even though economic and social effects of a project are not environmental impacts per se for purposes of CEQA. The results are included in the potential impacts to the human environment in Section 5.4 and Chapter 6 of the Draft ED. This economic analysis will be incorporated into the Fiscal and Economic Impact Statement, which will be reviewed by the Trade and Commerce Agency and must be approved by the Department of Finance. After that, the Department, on behalf of the Commission, will submit the analysis to the Office of

Administrative Law as part of the rulemaking file required to promulgate regulations. Against this backdrop, the Department believes the existing economic analysis provides important information to the Commission and public at large that will foster informed public decisionmaking.

Comment 13: Expresses general support for Alternative 5.

Response 13: See Response to Comment 10.

Comment 14: Expresses general support for the proposed project.

Response 14: Comment noted.

Comment 15: The proposal fails to consider a phased program with success demonstrated prior to expanding the reserve system.

Response 15: Phasing is discussed in the Initial Statement of Reasons for Regulatory Action and in Alternative 2 (the "Proactive Fishermen's Plan") as Attachment 8 to that document. For clarity, a summary of the same information is included in the Final ED in Section 3.2.2. Phasing, however, is not required by the MLPA. The act provides, in fact, that it is not intended to restrict any existing authority of the Department or the Commission to make changes to improve the management or design of existing MPAs, or to designate new MPAs. Phasing, as a result, is neither required nor prohibited by the MLPA.

The Department is not recommending phasing of the proposed project to the Commission for several reasons. First, some de facto phasing occurs as a natural consequence of program implementation: first by the Fish and Game Commission (for actions in state waters), and then later, by the CINMS (for actions in federal waters). Second, phasing can occur if the Fish and Game Commission decides to implement some portions of the plan before others. Third, phasing would not alter the final impacts to the environment of the whole project, although it could delay socioeconomic impacts over time. Fourth, phasing might add another layer of complexity to the implementation of monitoring, research, and evaluation activities, as well as to the generation of baseline information. Also, phased or incremental approach to implementation would not necessarily avoid socioeconomic impacts to recreational and commercial fishing, but would only draw them out. Most importantly, delays in implementing the MPAs would delay the realization of environmental benefits flowing from such MPAs.

Comment 16: Scientifically predictable results of the proposed project are uncertain.

Response 16: The Department rejects the implied assertion that absolute scientific certainty is necessary before the Commission takes action with respect to the proposed project. Neither the MLPA nor any other legal authority mandates such an approach.

In fact, the MLPA expressly contemplates and requires use of the "best readily available science" and the Draft ED adheres to such a standard. In the absence of location-specific empirical evidence, scientific theory and theoretical studies form the basis of best readily available science. Because there is little location-specific empirical evidence, the best readily available science regarding the proposed project, alternatives and their respective effects is grounded in sound scientific theory and theoretical analysis. Moreover, one of the reasons underlying the MLPA to establish MPAs in the first place is to obtain environmental "baseline information" and "and to establish environmental reference points." For this reason, the MLPA expressly contemplates the application of "adaptive management" in areas of scientific uncertainty as a framework to adjust management actions in response to monitoring, research and data indicating the need for such changes. The scientific basis for expected results of the proposed project is discussed in detail in the Draft ED Chapter 5.

One of the benefits of MPAs is that they provide a buffer against management uncertainty by maintaining portions of a habitat or population in a natural state that will provide baseline information and reference points against which scientists can measure changes elsewhere in the marine environment. In addition, the Channel Islands National Park Kelp Forest Monitoring program already provides a baseline of information for 16 sites that have been monitored for 20 years. The proposed project includes 7 of these 16 within MPAs, allowing comparison of changes after implementation. Analysis in the Draft ED is based, in part, on monitoring results over the past 20 years. In addition the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) monitors 6 additional subtidal sites. The PISCO sites have been monitored since 1999 and provide additional baseline information relied on in the Draft ED.

There is also no authority requiring resource managers to undertake site-specific research "from scratch" or that forbids reliance on existing, analogous research that has already been subjected to peer review. In fact analogous information is often used in scientific review or application of scientific information when site specific data are not available. Again, the MLPA, only contemplates the use of "the best readily available science." The Department believes that consideration of such studies meets this standard, and that reliance upon them is reasonable. In that respect, the SAP recommendation was based on the review of published scientific articles. Among those articles were studies of large fisheries management closures, as well as small and large MPAs. Their conclusions were based on both empirical evidence and theory found in the bulk of the articles (See Draft ED at pp. 5-7 through 5-12). In addition, most fishery scientists are familiar with the effects of marine reserves on protected habitats and species. According to the Pacific Fishery Management Council Draft Technical Analysis on Marine Reserves (Parrish et al., 2000) Marine reserves demonstrably conserve and enhance fish populations within their borders by (1) increasing fish abundance, size, and relative age composition, (2) protecting critical spawning stocks and habitats, (3) providing multi-species protection, (4) contributing to the preservation and maintenance of the natural diversity of individual species and habitats, and (5)

providing undisturbed, reference sites against which we can evaluate the effects of fishing and other human activities on marine ecosystems.®

According to Dr. Robert L. Shipp in his report to the Fishamerica Foundation, no-take MPAs can have a strong beneficial impact for fishery management during periods of active spawning, when species may be especially vulnerable to harvest, and when certain components of the stock (e.g., large male gag grouper) may be disproportionately liable to capture...In instances where a stock is severely overfished and subject to little or no management, a [no-take] MPA can be used along with other measures to more rapidly replenish populations...Where habitats are damaged by fishing practices, establishment of [no-take] MPAs may help ensure habitat recovery...[No-take] MPAs may also be beneficial where ecosystem management is employed in fisheries (primarily of near sedentary species) where by-catch of non-targeted species has become excessive, or conversely, where a protected species has reached population levels which increase natural mortality rates...® Likewise, Dr. Ray Hilborn of the University of Washington's College of Ocean and Fishery Sciences noted in comments on proposals for marine reserves in the Sanctuary that, A...it is almost universally accepted that exploitation reduces population sizes.... No-take areas, so long as their size is large relative to the movement of the species, will lead to increased abundance within the reserve.®

Comment 17: Adequate funding is not available to manage, monitor, and report on MPAs in the proposed project.

Response 17: The Department believes that adequate organizational resources exist to manage, monitor, and report on MPAs in the proposed project. The MLPA, with which this project must be consistent, expressly contemplates "management and enforcement measures[,] as well as provisions for "monitoring, research, and evaluation" as program components. The Channel Islands region is unique California in that the area has benefitted, currently benefits, and is expected to continue benefitting from the resources and coordinated efforts of multiple State and federal agencies. Through existing and new MOUs the Department, CINMS, and Channel Islands National Park will assist in monitoring, enforcement, and management of these areas. Existing monitoring projects (listed in the Draft ED at p. 5-14) will continue to provide data on changes in various species abundances in the region. These programs will contribute to the ability of the various agencies to provide adequate monitoring. Interagency coordination will also result in more efficient use of Department resources. Department enforcement staff will develop an enforcement plan in cooperation with other public agencies where existing MOUs are in place to coordinate such efforts. Some of these agencies also provide funding through the MOUs, including the CINMS, Channel Islands National Park, NOAA Fisheries, and the United States Coast Guard. In addition to research by State and Federal agencies, other research organizations and institutions (e.g., University of California, California State Universities, and California Sea Grant Extension Program) will likely also provide research, monitoring and evaluation opportunities.

The MRWG also made recommendations on monitoring, management, and enforcement of MPAs (See Draft ED Appendix 3). The CINMS SAC is currently using its public process to discuss potential monitoring programs, develop an MPA monitoring plan, and coordinate State and Federal enforcement agencies. The SAC will use existing MPA monitoring and enforcement, such as that occurring in Florida as examples. Both the CINMS and Channel Islands National park contribute funding to help monitor resources and enforce regulations within the project area. This unique situation allows for additional patrol time and equipment in the area to help address enforcement concerns. The Department has stationed a new 54' enforcement vessel in Ventura that will be dedicated to the region and a second vessel in Dana Point that will have the ability to patrol the region. All of these factors will contribute to the successful implementation of the proposed project.

Comment 18: The economic loss to recreational anglers would be too great for the local industry. This would have the greatest impact on recreational anglers who rely on the sport fishing fleet for recreation.

Response 18: The Department disagrees. The comment assumes that recreational fishing effort will not be redirected to other areas, or that recreational fishing will not benefit from the enhanced resource that the project is expected to provide. The maximum potential loss estimated for charter boat fishing in the proposed project area is approximately \$2 million or 11% of the total income currently generated. This potential loss assumes that no replacement of areas currently fished are available and that no benefits accrue over time from the proposed MPAs, both of which the Department believes are unlikely. The maximum potential loss estimated for commercial fishing is more than \$3 million or nearly 12% of the total ex-vessel value currently generated. Thus, neither group (recreational and commercial fishermen) is likely to be impacted more than the other. In addition, this level of potential loss is not expected to have long-term consequences for the charter fishing industry. When compared to increases in other regulations, such as reductions in bag limits, species closures, and seasonal closures, this potential loss may be offset by the long term resource sustainability that MPAs are expected to provide. Charter businesses may actually see an increase in business and greater opportunities to provide year-round fishing as MPAs begin to replace other, more restrictive, management measures such as complete closures for species groups throughout the entire State. The recreational anglers who rely on these boats to access the Channel Islands would also benefit from the more stable and sustainable resources. See also Response to Comment 5 regarding socioeconomic impacts.

Comment 19: There is no environmental disaster occurring in the CINMS that the creation of MPAs would cure. Many tools, sizes, seasons, and limits will work very well to maintain and improve fisheries while providing for the continuation of both recreation and an economically sound sport fishing industry.

Response 19: The Department disagrees. An "environmental disaster" need not exist before it is prudent to designate MPAs. Indeed, the Department believes that waiting for such a disaster before taking action is not responsible or prudent resource management.

Under the MLPA, with which the proposed project must be consistent, the goals and elements of the Marine Life Protection Program include sustaining, conserving and protecting marine life populations, as well as rebuilding those that are depleted. The Department believes that the proposed project advances all of these goals better than the other alternatives considered. The status of various fish and invertebrate species are described in Chapter 4 of the Draft ED. Continuing trends of decreasing populations for many species point to a need for new and different management strategies in addition to existing and traditional management. This is especially true for groundfish species (e.g., rockfishes) where population status is known to be very low with respect to historical levels. Declining trends in invertebrate populations have also been noted. Size limits, seasonal closures and bag limits do little to ensure the broad range of natural sizes and ages are maintained in a population. By removing the largest individuals and not protecting other sizes and species from bycatch, the long term sustainability of many populations has been damaged. Therefore, the Department believes MPAs will provide for a more complete management strategy that better provides for sustainable resources than would be obtained solely by relying on traditional fishery management tools. See also Response to Comment 4.

Comment 20: The document fails to consider a reasonable alternative of a limited, adaptive marine reserve process which would responsibly avoid unacceptable impact to the recreational sport fishing industry.

Response 20: The Department disagrees. The commenter did not articulate what is meant by "a limited adaptive marine reserve process," but appears to advocate an incremental approach consistent with the deferral alternative. The Draft ED includes an alternative to defer decision to the Marine Life Protection Act Process (see Draft ED at p. 6-64). The Department believes the alternative will not achieve the goals and objectives underlying the proposed action to the same degree as the proposed project.

The impacts of deferring any Commission action regarding MPAs in the Sanctuary to the ongoing MLPA process are unknown. Because this process could result in either the status quo (same as No Action) or new MPAs, it is not possible to predict potential environmental impacts (See Draft ED at p. 6-64). Certainly, deferral is not contemplated in the MLPA. The act, as noted in previous responses to comments, states that it is not intended to restrict any existing authority of the Department or the Commission to make changes to improve the management or design of existing MPAs or designate new MPAs. The proposed project falls squarely into this category.

Deferring any action to the MLPA process could diminish the benefits and dilute the high level of local involvement and input that occurred during the planning of the

proposed project. From a socioeconomic standpoint, the potential economic impacts to local harbors and communities B and, more importantly, to local individuals as expressed during the planning process B may be diluted by the overall economy of California. Further, an incremental approach would not necessarily avoid socioeconomic impacts to recreational fishing, but would only draw them out. Finally, the Department believes that deferring any action to the MLPA process will not achieve project goals and objectives to the same degree as the proposed project.

The Department does not believe that socioeconomic impacts to recreational fishing from the proposed project are unacceptable. Again, the comment assumes that recreational fishing effort will not be redirected to other areas, or that recreational fishing will not benefit from the enhanced resource that the project is expected to provide. In any case, there is no authority for the proposition that a "recreational preference" governs marine resource management decisions (See Response to Comment 46). The range of potential socioeconomic impacts to the recreational fishing industry in the proposed project and identified alternatives is from about \$2 million to more than \$4 million dollars in income, or nearly 8% to more than 17% of the income currently generated in the project area. It is not possible to completely avoid short-term economic impacts, as any MPA proposal would have some level of potential socioeconomic impact to recreational anglers. As noted in Response 18, the Department expects that the long term resource sustainability provided by MPAs would outweigh the short term economic impacts. In addition, this sustainability is expected to reduce the need for other, more restrictive, measures such as complete closures for certain species in all State waters. While some areas may be fished with an MPA designation, complete closures obviously do not permit fishing and, as a consequence, such actions could result in much more serious consequences for the recreational fishing industry.

The No Action Alternative would not achieve project goals and objectives because it would result in the continuation of current habitat and population trends (See Draft ED, Chapter 4). As noted in the PFMC Phase I Technical Analysis of marine reserves (Parish et al. 2001), the estimated biomass of the majority of West Coast groundfish species have long-term downward trends. This is also true for some other species. For example, since 1985, abundances of harvestable red urchins (*Strongylocentrotus franciscanus*) have declined by 1% per year at fished sites on Santa Rosa and San Miguel Islands relative to non-fished reserve sites on Anacapa Island (S. Schroeter & D. Reed, analysis of NPS data). The commercial fishery for rock crab (*Cancer spp.*) has localized effects on crab abundance and size. Crab fishing areas intensively exploited over an extended period show a lower catch-per-trip and reduced size frequency distribution compared to lightly exploited areas (Leet et al. 2001). Very little is known about the long term status of many other stocks, including certain invertebrates and nearshore rockfish. Effective management of marine fisheries must take into account uncertainties about the status of stocks and the entire ecosystem supporting them, which is an integral component of the proposed project as recommended by the Department. The failure to take such an approach, in the Department's view, is to

compromise ongoing efforts to rebuild overfished stocks and avoid other management actions that could have dramatic negative consequences for the fisheries.

Comment 21: Other management methods including "changing the size limit or limits... and support[ing] more fish hatcheries/habitat" should occur prior to any proposed closures.

Response 21: The Department disagrees. See Response to Comment 4.

Comment 22: Expresses general support for the proposed project.

Response 22: Comment noted.

Comment 23: Expresses general support for the proposed project.

Response 23: Comment noted.

Comment 24: Expresses general support for the proposed project.

Response 24: Comment noted.

Comment 25: Expresses general support for the proposed project.

Response 25: Comment noted.

Comment 26: Expresses general support for the proposed project.

Response 26: Comment noted.

Comment 27: The commenter supports a total fishing ban in 50% of all California waters.

Response 27: A 50% closure of all State waters to commercial and recreational fishing would not necessarily achieve environmental benefits superior to a more selective approach based on a combination of habitat representation and traditional fisheries management measures. The proposed project attempts to address a wide range of objectives, including both ecosystem biodiversity and limiting short term economic impacts. A total fishing ban over 50% of State waters would lead to significantly larger economic impacts than the proposed project. The Department believes that ecosystem protection can be provided through a network of smaller MPAs, as proposed, along with existing and new management measures that will lead to more sustainable resources.

Comment 28: States that no drifters, gillnets, seine nets or trawlers should be exempt from this total fishing closure.

Response 28: The proposed project is equally restrictive to these gear types as well as others and there are no exemptions. In one area, commercial lobster trapping would be allowed. This is based on the relatively low impact to other species and relatively healthy status of lobster populations. Drifters, gillnets, seine nets, trawl nets and other gear types would not be allowed in this area.

Comment 29: The commenter expresses support for the proposed project, but contends that the recommended network of reserves is "too small to adequately sustain marine resources" and that "only Alternative 5 is sufficient to achieve conservation of biological diversity and fisheries at the Channel Islands."

Response 29: See Response to Comment 10.

Comment 30: Expresses general support for Alternative 5.

Response 30: See Response to Comment 10.

Comment 31: Expresses general support for the proposed project.

Response 31: Comment noted.

Comment 32: The document could be improved by citing lack of peer-reviewed science predicting negative impacts of MPAs, as well as existing evidence suggesting that reserve establishment does not cause "congestion" impacts.

Response 32: The Department acknowledges the limited existing peer-reviewed research regarding potential negative impacts associated with the establishment of MPAs, including reserves. The Department, in this regard, is unaware of scientific studies that could be cited to support the notion that few studies and limited evidence exists on the subject. The existing analysis in the Draft ED, however, is based on and relies, in part, on peer-reviewed scientific studies; at least to the extent such studies exist. The existing analysis and references to the scientific literature relied on by the Department in the Draft ED are found at pages 1-14 through 1-16, and pages 5-17 through 5-18. In addition, revisions to Chapter 5 in the Final ED provide additional analysis and information addressing the issue of whether the proposed project will result in significant adverse environmental impacts associated with "congestion" (Sections 5.3.1.1, pages 5-17 through 5-19, and 5.3.2.1, pages 5-33 through 5-35). See also Response to Comment 5.

Comment 33: The final document should list Alternative 5 as the preferred alternative.

Response 33: The Department disagrees. The proposed project best meets all of the stated goals and objectives identified in the Draft ED. Likewise, the Department does not believe that Alternative 5 is environmentally superior to the proposed project. See Response to Comment 10.

Comment 34: Alternative 5 provides the most significant benefit.

Response 34: The Department disagrees. See Response to Comment 10.

Comment 35: The proposed project does not meet the conservation goals due to a lack of full habitat representation in all bioregions.

Response 35: The Department disagrees. Among all the alternatives identified in the Draft ED, the proposed project includes the highest number of habitats at a level of 20% or more. In particular bioregions this representation is significantly lower. In some cases this is due in part to the extremely small amount of an individual habitat available (e.g., less than 2 nm² of total kelp forest habitat in the Californian bioregion). It should be noted, however, that the MPAs in the proposed project are intended to work in conjunction with other fisheries management measures. These other measures will help complete necessary resource protection. See also Response to Comment 10.

Comment 36: The proposed project does not incorporate an insurance factor, nor do any alternatives except Alternative 5.

Response 36: The Department disagrees that only Alternative 5 includes an insurance factor and multiplier, thereby meeting the Ecosystem Biodiversity Goal. While the proposed project does not incorporate an explicit insurance factor, the proposal includes protective measures that, as a practical matter, achieve the same results. These other measures include spill response plans and vessel traffic separation schemes, which help prevent and respond to other threats from spills or other human catastrophes. The distribution of MPAs in multiple areas around the islands is designed to limit the impacts of single events on all reserves at once. Thus, while the proposed project was not increased in overall size in order to meet the Ecosystem Biodiversity Goal, it achieves the goal through other mechanisms. In addition, as noted in Response 10, the proposed project represents more individual habitats at a higher percentage than Alternative 5. It is thus more likely to meet ecosystem goals (See Draft ED pages 5-30 and 5-31).

Comment 37: The proposed project, Alternatives 4 and 5, and to a limited extent Alternative 3 have potential for connectivity.

Response 37: The Department agrees.

Comment 38: The proposed project, Alternative 4, and 5 allow potential monitoring using existing Kelp Forest Monitoring Sites.

Response 38: The Department agrees.

Comment 39: Alternative 5 best meets the goal of long-term sustainable fisheries while minimizing short-term economic impacts. The Science Advisory Panel already

considered minimizing economic impacts in their recommendation and thus, in order to meet both goals an alternative must fall within the SAP=s recommended range of 30-50%.

Response 39: The Department disagrees with this statement. The SAP, in making its recommendation, used two MRWG Goals: sustaining fisheries and ecosystem biodiversity. The SAP did not use the goal of minimizing short-term economic impact in their deliberations or recommendation. In addition, as noted in Response 10, the proposed project represents the same number of individual habitats (five) at a level of 30% or greater, and more habitats (12 compared to 11) at a level of 20% or greater than Alternative 5. The Draft ED describes another method to compare the alternatives with respect to the goals of ecosystem biodiversity and minimizing economic impacts on page 6-69 and in Table 6-58. This method provides a ratio of the amount of habitat set aside to the maximum potential economic impact (habitat representation per dollar impact). The proposed project has a higher ratio of habitat representation per dollar impact than Alternative 5 and therefore is better at minimizing cost while maximizing habitat representation (a proxy for protecting species). See also Response to Comment 10.

Comment 40: More treatment should be given to the potential negative impacts of the No-Project (No Action) alternative and Alternatives 1, 2 and 3.

Response 40: See Response to Comment 20 regarding the ANo-Action@ Alternative. Alternatives 1, 2, and 3, while less likely to meet the goals and objectives of the proposed project, would not likely result in negative environmental impacts. Because each of these alternatives increases the area currently protected in MPAs, they would have at least minor localized benefits. Alternative 1 is not expected to meet the goals of sustaining resources or representing habitats. Certain critical habitats are excluded from this alternative and there is no representation in the far eastern side of the Islands. Similarly, Alternatives 2 and 3 lack certain critical habitats and do not adequately represent most habitats. The impacts of deferring the decision to the MLPA process are unknown. Because this process could result in either the status quo or new MPAs, potential impacts are largely speculative. It bears emphasis that the No Action Alternative would not meet the goals and objectives of the proposed project; in particular the MRWG and MLPA goals of protecting representative habitats and ecological processes, maintaining areas for cultural and natural heritage, and providing for education and research within MPAs. These goals, taken together, require spatially explicit areas protected from all extractive use for sustained time periods, which can not be accomplished by existing regulations.

Comment 41: Expresses general support for the proposed project.

Response 41: Comment noted.

Comment 42: Expresses general support for the proposed project.

Response 42: Comment noted.

Comment 43: The FAA has no comments at this time.

Response 43: Comment noted.

Comment 44: The document assumes project-related socioeconomic impacts are negligible.

Response 44: The Draft ED does not deem project-related impacts negligible for purposes of CEQA. Instead, the Draft ED notes that social and economic effects are not considered environmental effects for purposes of CEQA. (Draft ED, Section 5.4.1, p. 5-43.) The Draft ED, nevertheless, provides a social and economic overview of the "Human Environment" in and around the area of the proposed project in the "Environmental Setting" section of the document, as well as analyzing related economic impacts. (Draft ED, Sections 4.4, 5.4.1-5.4.2, pp. 4-133 to 4-169, 5-35 to 5-55.) Against this backdrop, information in the Draft ED indicates that project-related social and economic effects will not result in significant, adverse environmental impacts. See also Responses to Comments 5 and 12.

Comment 45: The document assumes MPAs will protect areas from oil spills.

Response 45: The Draft ED does not make this assumption. It notes that an MPA network design should include multiple sights over a broad area to prevent a catastrophic event such as an oil spill which might impact multiple reserves at the same time (See Draft ED, Section 5.3.1, p. 5-15). See also Response to Comment 4.

Comment 46: The document is flawed because it puts marine reserves and commercial fishing ahead of the constitutionally protected interests of recreational anglers.

Response 46: The Department disagrees. There is no authority for the proposition that a constitutional "recreational preference" governs marine resource management decisions. The provision of the California constitution to which the commenter refers has been considered by the courts in the context of both recreational and commercial fishing. Further, the California Supreme Court has ruled that the power to regulate fishing has always existed as an aspect of the inherent power of the Legislature to regulate the terms under which a public resource may be taken by private citizens. This regulatory power applies to both recreational and commercial fishing: both the MLPA and the MLMA contemplate regulation of commercial and recreational fishing without expressing a preference for either. Nevertheless, the Draft ED and the proposed project do not place a higher priority on marine reserves and commercial fishing, as compared to recreational anglers. The proposed project, for example, includes areas where certain recreational activities (e.g., lobster diving or pelagic fishing) are allowed

while commercial activities are not. In this respect, the Department is recommending this and other pro-recreational angler components of the proposed project because the Department believes that recreational activities in certain specific areas are not contrary to the purpose of these individual sites. Moreover, the proposed project is intended and designed to provide sustainable fishery and marine resources in the long term, which will necessarily benefit recreational anglers generally, including in areas outside MPAs

Comment 47: The document does not address the problems of displaced effort or congestion of effort outside reserves.

Response 47: The Department disagrees. The Draft ED addresses the prospect that the proposed project will cause congestion of fishing efforts outside the proposed reserve system in Section 5.3.1, at pages 5-17 and 5-18. Potential project-related environmental impacts outside the proposed reserves are discussed in Section 5.3.2.1, at pages 5-31 and 5-32. Additional Information added to Chapter 5 in the Final ED provides further discussion regarding this issue. In contrast to the comment, alleged fishing congestion is not "looked at" in the Draft ED "as proof of a 'spillover' benefit." Instead, the Draft ED indicates that the "net effect of reducing [fishing] effort" as a result of various recent fisheries management actions, "while closing some areas to fishing" under the proposed project, "should limit the possibility for congestion outside the MPAs." In the Department's view, potential project-related "congestion" or "displacement" effects are expected to be less than significant under CEQA. Consistent with the adaptive management component of the proposed project, as required by the MLPA, ongoing monitoring, research and evaluation after project approval, will provide information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5.

Comment 48: The Marine Reserves Working Group Science Advisory Panel created their own mandate.

Response 48: The Department disagrees. The SAP process occurred in a transparent, public manner. The MRWG, a broad based constituent panel, directed the SAP to come up with a recommendation on reserve size based on two consensus goals (one for fisheries sustainability and one for ecosystem biodiversity). The SAP reported their results back to the MRWG and responded to MRWG questions and concerns.

The constituent involvement process lasted more than two years. To facilitate public participation, the MRWG sponsored three large public forums in Santa Barbara and Oxnard. Additionally, the SAP hosted over a dozen public meetings in Ventura and Santa Barbara Counties. Thus, while meeting locations reasonably focused on areas near the project area, interested resource users from adjacent areas such as Los Angeles still had ample opportunities to participate. Opportunities for involvement by

interested constituents continued through Fish and Game Commission meetings in Los Angeles County during and after the MRWG process. Several of these meetings included public comment on Channel Islands MPAs. In addition, attendance records from public meetings held specifically for the MRWG process indicate participation from Los Angeles County residents. The socioeconomic surveys included sampling in the port of San Pedro, and a complete census of charter boats that access the Channel Islands, including Santa Barbara Island.

Though the MRWG could not reach consensus on a particular MPA alternative, its input and detailed information provided significant guidance to the Department in drafting the project. The Department and CINMS developed a draft preferred alternative (proposed project) at the direction of the SAC after the MRWG forwarded their results. The draft proposed project was based on the information, goals, and objectives developed by the MRWG. This draft was released to the MRWG and public at large for comment and review. The Department revised the initial draft based on that input, and then subjected the revised proposal to yet another round of review by the MRWG and public. Information on that final comment and review has been added to the description of the MRWG process in Appendix 3 of the Draft ED, as are the MRWG goals and objectives.

Comment 49: Expresses general support for the proposed project.

Response 49: Comment noted.

Comment 50: Chapter 4 provides the appropriate baseline.

Response 50: Comment noted.

Comment 51: The document does not address the potential impact of status quo.

Response 51: See Response to Comment 20 regarding ANo Action@ Alternative.

Comment 52: The rationale for rejecting the alternative to defer to the MLPA is not clear.

Response 52: See Response to Comment 20 regarding "Deferral" Alternative.

Comment 53: The document does not address the problems of displaced effort in particular the potential for habitat effects.

Response 53: See Response to Comment 5.

Comment 54: Information on the specific level of effort and displacement is necessary to determine the relative impacts.

Response 54: Spatially explicit data on use are scarce for California as a whole, as well within the project area. The numbers provided in the Draft ED for maximum

potential loss to consumptive users is one way to gauge potential displacement. This does not, however, show the number of vessels that might be forced into closer proximity on a given day. The Department has added spatially explicit data on use to the document to help show the level of displacement each reserve might cause. This information can be found on page 5-32 in the Final ED. See also Responses to Comments 5 and 16.

Comment 55: The document's threshold of significance for habitat representation is not adequately explained.

Response 55: The threshold of significance for biological impacts is defined on page 5-6 of the Draft ED as ~~A~~any impact that has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory.~~@~~ Consistent with CEQA, this significance threshold serves as a gauge or measure to assess whether project-related impacts on biological resources are significant. The Department, in this respect, believes the threshold of significance is adequately explained. The comment appears, in part, to confuse CEQA's obligation to establish a significance threshold for project-related environmental impacts with the Department's recommendation regarding reserve size, as compared to the SAP's recommendation. The CEQA threshold of significance for biological resources, as noted above, is clearly articulated in the Draft ED at page 5-6. The comment, in contrast, refers to the criteria used for ~~A~~the purpose of comparison~~@~~ of habitat representation found discussed in the Draft ED in Section 5.3.1 on pages 5-6 through 5-18. These criteria were used in order to examine the relative biological benefits of the proposed project and each alternative, not (as in the case of the significance threshold) the potential for project-related environmental impacts. Chapter 5 has been reorganized and minor editorial corrections made to make this difference more apparent.

Comment 56: Beyond the issue of size, the SSC notes that habitat representation is a fundamentally sound approach to determining which areas to place in reserves for protecting biodiversity.

Response 56: Comment noted.

Comment 57: Substantial fisheries benefits on a stock-wide scale are unlikely to result under any of the MPA alternatives at CINMS. More specifically, the arguments for expected fisheries benefits (pp. 6-66, 6-67 and Figure 6-1) are technically weak and not compelling.

Response 57: The Department agrees that stock-wide benefits are difficult to predict and may not occur. This is in part true because the study area was limited to the

Sanctuary boundaries. However, this was not identified as an objective or goal of the MRWG process (see Draft ED Appendix 3, p A3-7). The Department also agrees that the statements made on the referenced pages and the figure used as an example by the commenter were difficult to understand. Given that they were not necessary in determining the potential for negative environmental impacts or in developing the criteria for comparison of alternatives, these statements and graph were removed from the final document.

Comment 58: The SSC agrees 1996-1999 is a reasonable baseline period for commercial fisheries. The SSC agrees with the assessment that activities within the CINMS account for less than 1% of total income and employment in the seven county area of impact.

Response 58: Comment noted.

Comment 59: The SSC requested documentation be added to the Draft ED (or at least the socioeconomic analysis) regarding how consumer surplus estimates were derived.

Response 59: The estimations of consumer surplus were developed by Leeworthy and Wiley and described in their report (Leeworthy and Wiley 2002). Though, the Department feels the justification for these estimates is adequately described in their report, Leeworthy and Wiley have also sent a specific response to this and other comments to the SSC. Leeworthy and Wiley's response is included in the Final ED as Appendix 7. Changes in the estimates of consumer surplus would not alter the potential impacts to the natural environment described in the Draft ED. See also Response to Comment 12.

Comment 60: The SSC considers the estimates of profits for the party/charter sector quite reliable.

Response 60: Comment noted.

Comment 61: It is not clear to the SSC why the value of fisheries at Tortugas should be a reasonable proxy for the value of fisheries at CINMS.

Response 61: The estimates of consumer surplus were developed by Leeworthy and Wiley and are incorporated in the Draft ED by reference. The method for determining this number is described on page 108 of Leeworthy and Wiley, 2002. They note that their estimates are not technically correct in that they overstate the commercial fishing values. Even so, since the same estimates were used for all alternatives, their use for estimating relative socioeconomic impacts among alternatives is still valuable. See also Response to Comment 12.

Comment 62: In order to apply the results used to determine elasticities (0.04, 1.0, and 4.5) for potential increases in recreational quality, it is necessary to make unsubstantiated assumptions.

Response 62: The Department acknowledges that these types of estimates are highly subjective. They were used as a general reference in order to compare economic impacts among Alternatives. Since the same range of elasticities was used for each alternative, the relative socioeconomic impacts are useful, if not exactly precise. See also Response to Comment 12.

Comment 63: The SSC expresses several reservations regarding the estimation of non-use values and the net benefits assessment found in Chapter 6 of the Draft ED. They also suggest that the benefits and potential costs of monitoring, research, and management should be analyzed.

Response 63: The Department appreciates this comment. The net benefit assessment was not critical to the development or comparative analyses of the proposed project. Section 6.8.2 of the Draft ED has been revised to more clearly represent potential costs and benefits in a qualitative manner. Quantitative references to potential benefits have been removed in the Final ED. See also Response to Comment 12 and Response to Comment 182 regarding passive use values.

Comment 64: The proposed project may have local benefits and, as part of a larger system, may help provide stock-wide benefits.

Response 64: The Department agrees.

Comment 65: Substantially more scientific work is needed before proceeding.

Response 65: The Department disagrees. See Response to Comment 16.

Comment 66: One impact may be displacement of effort into the albacore fishery.

Response 66: The Department believes any such impact will be less than significant under CEQA. See Response to Comment 5. The Department also notes that the PFMC will have jurisdiction over the albacore fishery when the Highly Migratory Species FMP is adopted, which is expected to occur in November 2002, and regulations are implemented in 2003. The Department will provide management input and coordinate with the PFMC to the extent feasible, which will help ensure that any project-related impacts to the albacore fishery remain less than significant.

Comment 67: The document fails to consider the body of opinion that finds only theoretical basis for a 30-50% set aside.

Response 67: As noted in Response 16, the MLPA does not require scientific certainty prior to acting. Instead, any MPA-related decisions must be based on the best readily

available science. Scientific theory and theoretical studies in the absence of empirical evidence form the basis of best readily available science. The Department, in this respect, relied on more than the single recommendation of a 30-50% set aside to develop the proposed project. The Department relied on a much broader spectrum of scientific input, as well as existing and new fisheries management strategies. See also Response to Comment 48.

Comment 68: A minority of the (PFMC Coastal Pelagic Species Sub-panel) advisors generally supports the proposed project.

Response 68: Comment noted.

Comment 69: Asked the Commission to look at the cumulative impacts of State and Federal actions on economics of other regulations as well as MPAs.

Response 69: Economic and social impacts are not environmental impacts per se under CEQA. See Responses to Comments 5 (regarding socioeconomic impacts), 76 (regarding recent groundfish closures), and 107 (regarding cumulative impacts).

Comment 70: Sport fishing only takes 3 to 6% of the total compared to commercial. Fisheries like trawl should be eliminated and we wouldn't need closures. Traditional management including size limits and slot limits would be better.

Response 70: The Department disagrees. See Responses to Comments 4 (regarding other management measures), 8 (regarding the proportion of fish taken), and 9 (regarding commercial regulation).

Comment 71: The commenter submitted several scientific papers that he felt supported Alternative 2 and the concept of holistic management.

Response 71: See Response to Comment 40 regarding Alternative 2.

Comment 72: The commenter expressed concern for the disproportionate impact to individual fisheries, particularly the red crab fishery.

Response 72: The Department does not feel that displaced effort in the red crab fishery will result in negative impacts to the environment (See Response to Comment 5). The commenter refers to "fisheries" in the context of commercial fishing or harvesting populations of marine fish. The Department disagrees that mitigation to such fisheries is required. A mitigation referenced in the Draft ED is in relation to environmental impacts to the resource, not the socioeconomic activities related to that resource. The commenter suggests that the two areas where the red rock crab fishery takes place are the Santa Cruz channel between Santa Rosa and Santa Cruz Islands and the North side of San Miguel Island. The maximum potential economic impact to the crab fishery for the proposed project is estimated at 14.8% of annual income; 5% of

this economic impact is generated within the proposed Carrington Point State Marine Reserve on Santa Rosa Island. This estimate is based on input received from fishermen in the project area. Particular areas, such as the offshore area to the northeast of San Miguel Island and within the Santa Cruz Channel east of Santa Rosa Island, were excluded in order to reduce potential economic impacts to this fishery as suggested by user groups. According to the "exclusion zones" maps developed by commercial fishermen in the socioeconomic survey, the most valuable locations also include the south side of San Miguel and Santa Rosa Islands (Leeworthy and Wiley 2002). In addition, they show that the most valuable areas are farther east in the Santa Cruz channel than the MPAs proposed for that area. According to Department landing data, rock crab is caught in all blocks surrounding the northern Channel Islands. Nearly 80% of this is caught on the north side of Santa Rosa Island and the South Side of San Miguel Island. Less than 2% is caught on the north side of San Miguel Island.

Comment 73: The Cape Canaveral experience shows that closed areas have very positive impacts on recreational fisheries.

Response 73: The Department agrees.

Comment 74: Even though there is no fishing allowed for abalone they haven't recovered. This is proof that MPAs do not work.

Response 74: The Department disagrees. The commenter is referring to a fisheries management measure that prohibits the take of abalone. This type of species specific regulation can not replicate the entire ecosystem protection provide by an MPA. It is, in fact, a good example of why single species protection alone may not function effectively for the goal of rebuilding depleted stocks. Other species that interact with abalone, such as sea urchins and sheephead, are still taken in locations where abalone are protected. The interactions between all these species can not occur in an undisturbed manner unless all are protected. MPAs may, in fact, provide additional benefits that do not currently occur.

Comment 75: The document fails to adequately represent the level of public support for a large network of no-take reserves.

Response 75: The Department disagrees. The Department feels that the proposed project adequately reflects the range of views expressed during the public process. These views included advocates for both higher and lower sizes of MPA networks. The proposed project attempts to balance those views while still achieving the project goals. The extensive public participation process is documented in the Draft ED at Appendix 3.

Comment 76: More specific characterization of the importance of the nearshore marine environment of the study area should be developed in light of recent fishing closures, and the threat these closures pose to the marine life of the study area.

Response 76: The Department agrees that recent groundfish management activities may create a need for more attention on nearshore habitats. The Department believes that the proposed project adequately characterizes the nearshore marine environment (see Draft ED at 4.3, "Biological Environment"). The reference to "recent fishing closures" is to the emergency action taken by the PFMC to close the continental shelf between 20 and 150 fathoms to all fishing for groundfish in July 2002. The PFMC formalized this action in September 2002, with strict gear restrictions for fishing in this range. The scale of this action (100% of the shelf closed to activities that impact groundfish) implicates a need to address potential shifts in fishing activities. Some of this has already occurred through regulations promulgated by the PFMC and Commission that will close all nearshore areas to fishing for rockfish, lingcod, cabezon, and greenlings for six months of the year, coupled with increased restrictions on recreational daily bag limits. The PFMC has made adjustments to commercial trip limits for minor nearshore rockfish, and the Commission will be considering additional regulations. The Nearshore Fishery Management Plan (FMP) establishes Total Allowable Catch levels for both commercial and recreational fishing for State managed species. In addition, under the Nearshore FMP a restricted access program is under development. These changes, along with other ongoing management that limits the amount of take allowed, are noted in the Draft ED on page 5-18 as rationale for the proposed project not leading to significant congestion related impacts. Even so, the shelf closure may suggest an even greater need for establishing MPAs in nearshore habitats to guard against potential reductions in populations as the nearshore becomes even more important for consumptive users. Therefore, the shelf closure does not change the Department's position on the proposed project.

The shelf closure does not, however, provide equal protection in deeper habitats to the proposed MPAs and should not be considered a surrogate. Various fisheries and gear types are still allowed to fish on the shelf under then new PFMC regulations. Thus, the ecosystem protection provided by an MPA is not provided by this closure. The closure will be reviewed annually and could be modified or removed if new population estimates are developed. MPAs in the area would be more lasting and could remain in place if the shelf closure is lifted, maintaining an adequate amount of habitat protected to meet the variety of goals addressed in the proposed project.

Comment 78: The proposed project cannot protect kelp ecosystems in the California and Oregonian biogeographic provinces.

Response 78: The Department believes the proposed project adequately protects kelp ecosystems. Overall, the proposed project establishes reserves to protect 21% of the existing kelp habitat in the Channel Islands National Marine Sanctuary, which includes kelp in the biogeographic provinces identified by the commenter. Additional kelp beds in the project area are also protected by the nature of the environment, particularly wash rocks or pinnacles near the surface that preclude harvesting because of limited or non-existent vessel maneuverability in these areas. Thus, while only 21% of the total

habitat is contained within proposed reserves, more of the area is unharvestable and thus not in need of additional protection. Taken together, the Department believes the "proposed reserve scenario" as described by the commenter does, in fact, protect a significant portion of the kelp ecosystems in the California and Oregonian biogeographical provinces.

Comment 79: Quality habitats are not included in the proposed project, in particular high quality nearshore habitats less than 20 fathoms deep. Some of these habitats may be cut by the Department to support the short-term interests of commercial and sports fishing industries.

Response 79: The Department disagrees. Due to the subjective nature of determining habitat quality, the proposed project instead focused on including a wide variety of habitats. One way of determining the relative value of an individual area is to consider the number of habitats within that single area (habitat heterogeneity). Figure 8-1 depicts the overlap of the proposed project and areas of highest habitat heterogeneity. These areas include breeding sites, marine mammal haul outs, rare habitats, and critical habitats for various species of interest all of which are included in the proposed project. With respect to nearshore habitats, the proposed project includes between 28% and 34% of all habitats shallower than 30 m (16 fathoms) within the Sanctuary. This is relatively high representation as compared to any of the other alternatives. With respect to the comment that the Department may Acut@ some of these habitats, the Department is not recommending any such action and approval of the proposed project, any alternative, or combination thereof is in the discretion of the Fish and Game Commission.

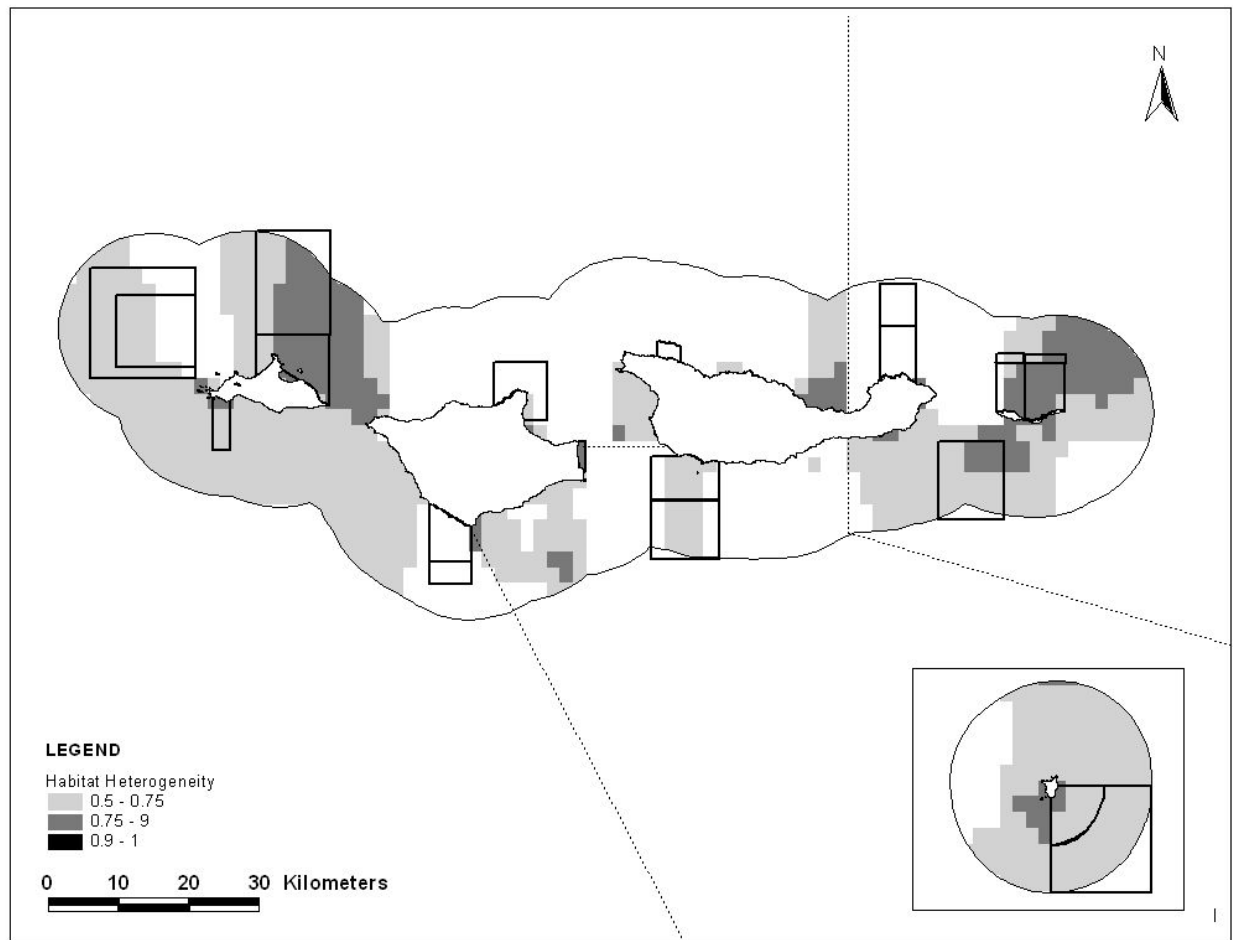


Figure 8-1: Relative heterogeneity of habitats. Darker areas represent higher levels of heterogeneity (more habitats per unit area). The Proposed Project is overlaid.

Comment 80: It makes sense to first implement MPAs at the Channel Islands and then continue with the rest of the Southern California Bight. That is, in fact, phasing in of MPAs.

Response 80: The Department agrees with the approach of implementing MPAs at the Channel Islands prior to the rest of the coast. The Draft ED states on pages E-3 through E-4 that a timely decision will provide needed insight and experience in the implementation of reserves before the MLPA suggests MPAs for the entire State.⁶ While this could be considered a form of phasing, the Department notes that no project is proposed at this time for the rest of the State, so subsequent phases are not known or guaranteed. Another form of phasing is the Federal waters phase as discussed in the Draft ED. For the proposed project, a specific proposal to expand MPAs into Federal waters exists and has been discussed with respect to cumulative impacts. See also Response to Comment 15.

Comment 81: Additional kelp forest habitat should be included.

Response 81: The Department disagrees. See Response to Comment 78.

Comment 82: Licensed launches from the California Spaceport are not mentioned in the Draft ED and (MPAs) may affect the commercial launch industry.

Response 82: The Draft ED relates only to the proposed project for Marine Protected Areas around the Channel Islands. The comment appears to confuse the MPA issue with that of the National Marine Sanctuary's management plan revision, a separate Federal process. While Vandenberg Air Force Base and the California Spaceport are near the project area, the proposed project would have no impact on existing regulations regarding space launches or the commercial launch industry. Marine Protected Areas, if adopted, will be created through the authority of the Fish and Game Commission. The specific regulations for MPAs are stated in the proposed regulations as prohibiting activities that would injure, damage, take, or possess any living, geological, or cultural marine resource...@ (Proposed Section 632, Title 14, California Code of Regulations). Space launches at the California Spaceport, located approximately 25 nautical miles from the nearest proposed MPA, would not be expected to lead to resource injury, damage, take, or possession. The proposed project does not change the boundaries of the Channel Islands National Marine Sanctuary. The Department, in this respect, also does not believe that the proposed project may affect "licensed launches" from the identified facilities.

Comment 83: Appears to advocate a "No Action" alternative in favor of recreational fishermen.

Response 83: See Response to Comment 20 (regarding No Action) and Comment 46 (regarding recreational preference).

Comment 84: The document provides inadequate information on the impacts of the status quo.

Response 84: See Response to Comment 20 (regarding No Action).

Comment 85: The goals and objectives for individual sites are not provided, nor a discussion of why the overlap map was enlarged.

Response 85: The Department disagrees. Chapter 5.3.2.1 describes the habitats and/or species represented in each MPA in the proposed project. This information can be used to show how each MPA helps fulfill the goals of the project as a whole as well as how the individual MPAs are intended to function as a network. While the areas of overlap do represent agreement on specific sites that might be included in an MPA network, they do not represent agreement from all sides on a proposed network. Some of the MRWG members felt that this map would need to be increased to include representative habitats in all bioregions. The Department's proposed project attempts to meet the goals provided by the MRWG, as well as those in the MLPA, and is therefore different from the overlap areas.

Comment 86: In order to fully evaluate the costs and benefits of proposed networks the entire State process should proceed at the same time.

Response 86: The Department disagrees. The comment refers to including the Channel Islands decision in that for the MLPA Master Plan process regarding the entire State (the defer alternative). See Response to Comment 20 regarding the defer alternative.

Comment 87: The document does not adequately discuss the potential impacts of effort displacement.

Response 87: The Department disagrees. See Responses to Comments 5 and 47.

Comment 88: The document=s threshold of significance for habitat representation is not adequately explained.

Response 88: The Department disagrees. See Response to Comment 55.

Comment 89: The document fails to address the concerns of scientists who disagree that MPAs are the only cure for perceived ills, particularly those related to fishery management.

Response 89: The Department agrees that MPAs are not the only tool available to fisheries managers. See Response to Comments 4 and 16.

Comment 90: Constituent involvement in MPA planning is essential.

Response 90: The Department agrees. See Response to Comment 48 and 75.

Comment 91: Asserts that MPAs are a valuable tool, but disputed by most fisheries scientists.

Response 91: The Department disagrees. See Response to Comments 4 and 16.

Comment 92: Marine reserves will do little toward achieving optimum yield for epipelagic and migratory species.

Response 92: MPAs provide epipelagic and migratory species with limited benefits due to their migratory nature. Epipelagic and migratory species do, however, fulfill an ecosystem role within MPAs as predators on and forage for other species. MPAs can also contribute to achieving sustainability by providing protection to epipelagic or migratory species when they are aggregated for breeding, feeding or other purposes.

Comment 93: A single percentage set aside will not work in all cases.

Response 93: The Department agrees with this statement. The proposed project was designed for the specific case of the project area. It is intended to function within the framework of existing and planned management measures as well as the status of species in the area. In other cases a different percentage set aside may be required.

Comment 94: Dense populations within reserves do not necessarily lead to increased catches in surrounding waters.

Response 94: The Department disagrees. Many studies have shown either increased catches or increased numbers of fish and invertebrates adjacent to Marine Protected Areas. These results would not be expected for highly sedentary species that do not move out or transport larvae out of an MPA, or for migratory species that do not spend a significant portion of time within MPAs. The Department believes that those species with large enough home ranges or larval dispersal will spillover into adjacent areas. See also Response to Comment 5 regarding production increases.

Comment 95: Existing reserves and those proposed have been established without baseline studies.

Response 95: The Department agrees that many existing MPAs were established without baseline studies. Indeed, one of the express functions of MPAs in the MLPA Program is the provision of baseline information. Also, the MLPA provisions regarding adaptive management clearly contemplate the establishment of MPAs, even in areas of scientific uncertainty. However, that is not the case with the proposed project which has some available baseline data. Likewise, the Department believes the Draft ED provides sufficient, detailed information regarding the environmental setting in and around the area of the proposed project, and that this "baseline" is adequate to assess potential project-related significant effects under CEQA. See Response to Comment 16.

Comment 96: Management may need to include a variety of options including selective fishing.

Response 96: The proposed project includes two areas where selective fishing would be allowed. The first would allow both commercial and recreational lobster fishing and recreational pelagic fishing. The second would allow only recreational lobster and pelagic fishing. In these cases, the allowed activities are consistent with the level of protection envisioned and would allow for some fishing activity to occur while providing additional protection for resident fish and invertebrates. See also Response to Comment 16 regarding adaptive management.

Comment 97: The Primary emphasis should be on protection of valuable and vulnerable areas, rather than on achievement of a percentage goal for any given region.

Response 97: The Department agrees. The NRC, in their report Marine Protected Areas: Tools for Sustaining Ocean Ecosystems concluded, among other things, that "...the complete spectrum of habitats supporting marine biodiversity should be included with emphasis on safeguarding ecosystem processes" (NRC 2001). The NRC also states that for the goal of protecting a sufficient fraction of marine habitats "...the primary consideration...should be the needs of each biogeographical region based on protecting critical habitats (such as spawning grounds, nursery grounds, or other areas harboring vulnerable life stages) and special features (such as seamounts, hydrothermal vents, and coral reefs)" (NRC 2001). This approach is consistent with that used by the Department in developing the proposed project (See Response to Comment 79). Due to the subjective nature of determining habitat quality, the proposed project instead focused on including a wide variety of habitats. Figure 8-1 depicts the overlap of the proposed project and areas of highest habitat heterogeneity. These areas include breeding sites, marine mammal haul outs, rare habitats, and critical habitats for various species of interest all of which are included in the proposed project. This is also noted in the descriptions of the biological impacts of individual reserve sites in Chapter 5 of the Draft ED. Percentage calculations were used to determine the relative level of habitat representation among alternatives not as a goal. These calculations also provided an index of how well particular alternatives would be expected to perform based on available biological information.

Comment 98: The potential economic and ecological benefits of marine reserves will not be realized without a sufficient commitment to enforcement and monitoring.

Response 98: The Department agrees. Suggestions for management, monitoring, and enforcement were provided by the MRWG (See Draft ED, Appendix 3 on pages A3-8 through A3-11). See also Response to Comment 17.

Comment 99: The SSC considers the choice of reserve size to be a policy decision.

Response 99: The Department agrees. This comment refers to the recommendation for reserve size (30-50% of each habitat type) made by the MRWG SAP. The comment refers to this recommendation to illustrate the fact that the SAP combined two goals (ecological and fisheries) and weighted them equally without direction from the MRWG on how to weight the goals. The SSC felt weighting the goals was a policy decision. It should be noted that the Department, in developing a policy recommendation for the Commission, chose to use a significantly smaller overall size (19% of State waters) and based its criteria for habitat comparison on other scientific recommendations as well (20% or more as "adequate"). The Fish and Game Commission will make the ultimate policy determination for MPAs in the project area.

Comment 100: Substantial fisheries benefits on a stock-wide scale are unlikely to result under any MPA alternative.

Response 100: The Department agrees. Most fish stocks found in the project area represent only a minor portion of the entire statewide stock. While stock-wide benefits would not be expected, local populations are expected to increase. It is this local significance that reinforces the idea of using a regional approach. The proposed project will benefit only local populations, but could become a part of a more comprehensive network that could benefit entire stocks. See also Response to Comment 57.

Comment 101: It is not possible to draw any conclusions regarding the relative costs and benefits of marine reserves.

Response 101: The Department disagrees. The long term environmental benefits of MPAs are clear and these benefits support the projects goals and objectives. The MLMA emphasizes that the long-term health of marine resources should not be sacrificed for short-term benefits. This is consistent with the proposed project's goals. The economic analysis developed for the proposed project is much more detailed than for most fisheries management decisions. Even so, comparisons of potential short-term costs and potential long-term benefits from a purely economic perspective are difficult because each involve estimates of how human behavior may change in response to the proposed project. The existing discussion acknowledges these limitations and provides a thorough analysis nonetheless. See Response to Comment 12.

Comment 102: The new de facto reserve established through the groundfish closures must be considered.

Response 102: See Response to Comment 76.

Comment 103: Reserves do not address the prospect of sea otter emigration into southern California.

Response 103: MPAs will not prevent the impacts of natural events or natural interactions between species that may lead to declines in some populations. The natural ecological interactions between predator and prey species are critical to the function of an MPA. While sea otters are a particularly voracious predator of many marine invertebrates, they do coexist with their prey species in abundances that allow prey populations to persist. These population levels may, as in the case of abalone, be significantly lower than in the absence of otters. Although otters may reduce localized invertebrate populations, any such reduction would be a return to the balance that existed prior to otter removal.

Comment 104: The Department has segmented the project in violation of CEQA sec. 15165. The implementation of the MLPA is foreseeable and should have been the full project reviewed in the draft Document.

Response 104: The Department disagrees that focusing environmental review on the proposed project, as opposed to implementation of the MLPA as a whole, violates CEQA's proscription against "piecemealing" or "segmented" environmental review. The MLPA directs the Commission to reexamine and redesign California's MPA system through the adoption a Marine Life Protection Program and the subsequent implementation of that program through the adoption and implementation of an associated master plan. (See generally Fish & G. Code, Sections 2853, 2855). The MLPA process is currently underway, separate and apart from the proposed project.

The MLPA provides that nothing in the act "restricts any existing authority of the department or the commission to make changes to improve the management or design of existing MPAs or *designate new MPAs* prior to the completion of the master plan." [*Id.*, Section 2861, subd. (c) (emphasis added)]. The MLPA, as a result, expressly authorizes and contemplates the designation of new MPAs prior to adoption of the master plan. The proposed project is entirely consistent with this provision of the MLPA. The MPAs contemplated by the proposed project are, in fact, independent of any actions the Commission and Department may take at some point in the future to adopt or implement the Marine Life Protection Program and the related master plan. Stated another way, the proposed project is neither a necessary precedent for the MLPA process nor does it commit the Department or Commission to adopt and implement a specific Marine Life Protection Program or master plan. The Draft ED does not violate CEQA's proscription against segmented environmental review for the same reasons.

The Department specifically disagrees that the scope of environmental analysis in the Draft ED violates "CEQA Guidelines" section 15165. (See Cal. Code Regs., tit. 14, Section 15165). As recently noted by the judiciary, the fact that this provision of the guidelines "refers to 'projects . . . to be undertaken' confirms that it is intended to apply only to project components that an agency is proposing to implement. It does not extend to preliminary plans, feasibility studies or contemplated development the agency is not proposing to approve or undertake." [*Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners* (2001) 91 Cal.App.4th 1344, 1358, fn. 9 (internal citations omitted); see also *City of Vernon v. Board of Harbor Commissioners* (1998) 63 Cal.App.4th 677, 688]. The Department, in this regard, is not proposing that the Commission approve, undertake, adopt or implement a Marine Life Protection Program or a related master plan. CEQA Guidelines section 15165, as a result, does not apply.

Likewise, the Department disagrees that *Laurel Heights Improvement Assoc. v. Regents of the University of California* (1988) 47 Cal.3d 376, 393-399, compels analysis at this juncture of the environmental effects that may result from the future implementation of the MLPA. In *Laurel Heights*, the California Supreme Court articulated a two-prong test to determine when environmental analysis under CEQA must take into account reasonably foreseeable future phases, or other reasonably foreseeable consequences, of a proposed project. Under the court's two-prong test, environmental analysis under CEQA must include analysis of the environmental effects

of a future expansion or other action if (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will likely change the scope or nature of the initial project or its environmental effects. (*Id.* at pp. 396). "Absent these two circumstances," the court emphasized, "the future expansion need not be considered in the [environmental analysis] for the proposed project." (*Ibid.*).

In contrast to the commenter's assertion, actions that the Commission and Department may take at some point in the future under the MLPA are not a "reasonably foreseeable consequence" of the proposed project. The Commission and Department have neither made decisions, nor formulated reasonably definite proposals as to any future actions under the MLPA regarding the Marine Life Protection Program or the related master plan. In fact, efforts by the Commission and Department to seek input from the public and interested agencies regarding potential future actions are just underway. This preliminary effort to garner public input and the prospect of action at some point in the future do not constitute an irreversible commitment by the Commission or Department to a particular course of action. In this respect, possible future actions under the MLPA are not "linked" to the proposed project. Indeed, as noted by the Supreme Court, "the mere fact that a lead agency acknowledges that it contemplates such a long-range goal [e.g., compliance with the MLPA] is not, by itself, sufficient to conclude that it is a 'reasonably foreseeable consequence of the initial project.'" (*Berkeley Keep Jets Over the Bay Committee, supra*, 91 Cal.App.4th at p. 1362, citing *Laurel Heights Improvement Assoc., supra*, 47 Cal.3d at p. 396). Accordingly, possible future actions under the MLPA are not a reasonably foreseeable consequence of the proposed project.

Comment 105: Due to lack of public participation and oversight in designing the DFG/CINMS preferred alternative, it is difficult to understand what specific goals have been achieved.

Response 105: The Department disagrees. See Response to Comment 48 regarding public participation. Attainment of project goals, of course, depends first upon project implementation.

Comment 106: The congestion resulting from displaced effort into areas immediately outside and adjacent to MPAs will result in an adverse environmental impact.

Response 106: The Department disagrees. See Response to Comment 5.

Comment 107: The Draft ED does not include the MLPA, cowcod, or shelf closures in a cumulative impacts analysis.

Response 107: The Marine Life Protection Act is specifically discussed in the description of project objectives found in Chapter 1. As noted in Response to Comments 54 and 104, the MLPA process is ongoing. The Cowcod Conservation Areas were addressed in the proposed project, including a recommendation to reopen

a portion of the area. The Pacific Fisheries Management Council's recent shelf closures occurred as an emergency action after the publication of the Draft ED. The implications of this action are discussed in Response 76. In the Department's view, the MLPA, Cowcod Conservation Areas, and shelf closures will not render the proposed project's incremental change to the existing physical conditions in and around the project area cumulatively considerable under CEQA. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant cumulative impacts.

The commenter asserts that the cumulative impacts analysis in the Draft ED violates CEQA because of the purported failure to consider the MLPA, Cowcod Conservation Areas, and shelf closures. The Department disagrees. The Draft ED is a CEQA functional equivalent document prepared by the Department pursuant to the Commission's certified regulatory program in section 781.5 of Title 14 of the California Code of Regulations. (See generally *Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 113-114.) In this respect, the Department acknowledges that the Draft ED must provide a meaningful assessment of whether the proposed project may result in significant cumulative impacts. (See, e.g., *Mountain Lion Coalition v. California Fish and Game Commission* (1989) 214 Cal.App.3d 1043, 1051.) It does provide the assessment, in the Department's view, and the commenter offers no substantial evidence to the contrary. That is, the commenter offers no substantial evidence that three allegedly foreseeable projects render the proposed project's less-than-significant impacts cumulatively considerable.

The commenter's cumulative impacts contention rests on the notion that the MLPA, Cowcod Conservation Areas, and shelf closures are "reasonably foreseeable" under existing case law and that these projects must be included in the cumulative impacts analysis pursuant to CEQA Guidelines section 15130. (See Cal. Code Regs., tit. 14, Section 15130.) The provision of the guidelines cited by the commenter, however, governs cumulative impact analyses in environmental impact reports, as opposed to environmental documents prepared pursuant to a certified regulatory program. Where an agency proceeds under CEQA by way of a certified regulatory program ^B such as the Commission in the present case ^B it need not prepare a cumulative impact analysis precisely as set forth in section 15130. Instead, an agency acting pursuant to a certified regulatory program must "consider" the prospect of significant project-related cumulative impacts where relevant, although it need not prepare an "analysis as such." (*Laupheimer v. State of California* (1988) 200 Cal.App.3d 440, 462, 466; see also "Discussion" following CEQA Guidelines, Section 15252.) In this respect, the Department believes that the Draft ED includes meaningful consideration and assessment of potential project-related cumulative impacts, and that the analysis is adequate under CEQA, particularly where substantial evidence supports the conclusion

that the proposed project will not result in significant cumulative impacts. Please see Response to Comment 104 regarding alleged "piecemealing" and "segmented" environmental review in the Draft ED.

Comment 108: The document does not mention the current array of fisheries management measures and makes no mention of abundant stocks.

Response 108: The commenter contends the Draft ED "fails to mention" various issues and that the alleged failure renders the Department's consideration of the No Action Alternative inadequate. The Department believes, in contrast, that the existing analysis in the Draft ED of the No Action Alternative fully complies with the Commission's certified regulatory program in section 781.5 of Title 14 in the California Code of Regulations, as well as the principles governing alternatives analysis under CEQA generally. The Department, in this regard, believes the Draft ED provides sufficient information to the Commission as the lead agency for the proposed project under CEQA. Please also see Response to Comment 109 for more information regarding analysis of the No Action Alternative in the Draft ED.

The Department disagrees that the alleged failure to "mention" certain information renders consideration of the No Action Alternative inadequate. The commenter contends that the Draft ED "fails to mention": (1) the benefits the Sanctuary offers to fishing; (2) the current array of fishery management measures that regulate fisheries in the project area; (3) an analysis of whether such measures "have failed," if at all; and (4) the "abundant [fish] stocks" that currently exist in and around the project area. While the Sanctuary itself has no direct prohibitions on fishing, the Draft ED, in contrast, describes the current status of both fisheries and species in detail in Chapter 4, Sections 4.3.3.3 through 4.4.1.2 at pages 4-42 through 4-146. These descriptions indicate that existing regulations are not adequately protecting some species, nor providing for long term sustainability. The existing ecological reserves at Anacapa, San Miguel, and Santa Barbara Islands are described on pages 3-1 and 3-2 of the Draft ED. These ecological reserves include two small invertebrate closures, a brown pelican fledgling area, and seasonal closures for the protection of marine mammals. Likewise, the Department added a table showing existing fisheries regulations to page 4-146 of the Final ED to facilitate understanding of existing regulations. Additional discussion of the efficacy of existing regulations is found in Response to Comment 20 regarding the No Action alternative. Finally, please also see Responses to Comments 4, 19, and 118 regarding the current status of marine resources, including fish stocks in and around the project area, and the basis for the Department's fishery management recommendations in the proposed project.

Comment 109: The Document fails to adequately consider the No-Action alternative (Alternative 7).

Response 109: The Department disagrees that the Draft ED fails to "adequately consider" the No Action Alternative. The commenter contends the Department's analysis of the No Action Alternative is inadequate because it fails to present "any

convincing evidence that the current fishery management measures are inadequately protecting the resources in the project area." In so doing, the commenter questions the basis and need for the proposed project, asserting that there are "abundant stocks" ignored by the Department which render the proposed project unnecessary in the absence of more specific scientific information to the contrary.

At the outset, the Department disagrees with the commenter's assertion that discussion in the Draft ED of the No Action Alternative is limited to two paragraphs. Alternatives to the proposed project are introduced for the first time in Section 3.2 of the Draft ED, with the No Action Alternative described on page 3-16. Noting that the alternative "would continue the existing Marine Protected areas in the Sanctuary with no modifications[,]" the Draft ED refers the reader to Appendix 1, which sets forth a 58-page overview of current Marine Protected Area laws and regulations. This discussion provides an important framework for analysis of the No Action Alternative at pages 6-64 and 6-65 in the Draft ED. That analysis, in turn, is further informed by the 175-page overview of the existing conditions and "environmental setting" provided in Chapter 4 of the Draft ED. This "baseline" discussion provides a comprehensive discussion of the existing physical and socioeconomic conditions in and around the area of the proposed project, and includes reference to empirical data relevant to the purpose and need for the proposed project. The Department, in this respect, disagrees with the commenter and respectfully refers the commenter to these sections of the Draft ED for additional information. Also, please see Response to Comment 20 for additional discussion of the No Action Alternative.

Finally, the Department disagrees with the assertion that the Department is recommending adoption of the proposed project based on an assumption "that resources in the project area are being unnaturally reduced due primarily to the impact of past human actions, and that these resources are likely to be further reduced with attendant losses of commercial and recreational opportunities." As noted in the MRWG problem statement (See Draft ED at p. 1-3), the proposed project addresses declines caused by a variety of factors, including human activities, climactic changes, and changes in predator populations. One of the goals of the proposed project is to help provide for sustainable resources, which would necessarily provide for more stable commercial and recreational opportunities.

Comment 110: The Draft ED does not propose adequate monitoring. It does not propose adequate pre-project monitoring and must include a detailed monitoring and enforcement plan.

Response 110: The Department disagrees that the proposed project fails to provide for adequate monitoring. See Response to Comment 17. The commenter suggests that specific Catch Per Unit Effort (CPUE) data must be collected in order to determine both MPA effectiveness and whether or not negative economic impacts have occurred. While CPUE data may be used in monitoring efforts, these data are often problematic when trying to determine population status. CPUE may remain high while total

population declines due to a variety of other measures including outside management (e.g., Karpov et al. 2000). Conversely, fisheries independent monitoring, based on annual or more frequent measurements of populations, can provide indices of relative abundance. This is the case with the ongoing Channel Islands National Park Kelp Forest Monitoring program. As noted on page 5-30 of the Draft ED, the proposed project includes 7 of the 16 existing National Park Kelp Forest Monitoring sites that can be used as indicators of population trends. In addition, as part of the Department's Nearshore Fishery Monitoring both SCUBA and Remotely Operated Vehicle (ROV) surveys have been proposed. These surveys will provide ongoing population monitoring both within and outside MPAs. The ROV surveys will allow for monitoring of areas deeper than those within the depth range accessible to SCUBA divers. The MRWG also made recommendations on the monitoring, management, and enforcement of MPAs. These recommendations are included in Appendix 3 of the Draft ED. The SAC is currently using its public process to discuss potential monitoring programs, develop an MPA monitoring plan, and coordinate State and Federal enforcement agencies. The SAC will use existing MPA monitoring and enforcement, such as that occurring in Florida as examples. Both the CINMS and Channel Islands National Park contribute funding to help monitor resources and enforce regulations within the project area. This unique situation allows for additional patrol time and equipment in the area to help address enforcement concerns. The Department recently stationed a new 54' enforcement vessel in Ventura that will be dedicated to the region and a second in Dana Point that can patrol the region. All of these factors will contribute to the successful implementation of the proposed project.

Comment 111: The Draft ED does not adequately propose mitigation for individual fisheries impacted by the proposed project particularly the red crab fishery.

Response 111: The commenter takes issue with the "lack of a mitigation proposal" in the Draft ED. The commenter deems the lack of proposed mitigation unacceptable, contending that the proposed project may result in "adverse impacts on fish populations in the remaining open areas." To support its argument, the commenter refers to the red crab fishery at San Miguel and Santa Rosa islands, noting that the proposed project contemplates a substantial closure of the fishery in and around these islands. In the commenter's view, ongoing capacity reduction through the Fishery Management Plan process will not reduce project-related adverse impacts on fish populations in remaining open areas to a less-than-significant level because the red crab fishery "is an open access fishery with no limitations on the number of permits issued."

The Department disagrees that the proposed project will result in significant adverse impacts on fish populations outside of the areas proposed for closure due to increased or "congested" fishing efforts. The basis for the Department's conclusion is detailed in the Draft ED at pages 5-17 through 5-18 and 5-31 through 5-32. In addition, please see Response to Comment 5 for additional explanation and analysis of this issue.

As for the red crab fishery and the proposed closures around San Miguel and Santa Rosa islands, the Department does not believe significant congestion-related impacts on fish populations will result. While the rock crab fishery is currently open access, with no restrictions on the number of permits issued, it is a relatively small scale fishery. Legislation (SB 2090) will become effective January 2003 that will give the Commission authority to regulate this fishery, including consideration of a restricted access program. According to Department landings data, an average of between 35 and 40 vessels land rock crab caught at the Channel Islands. These vessels focus primarily on the north side of Santa Rosa Island and the south side of San Miguel Island. The south side of San Miguel Island would have only a small amount of area closed, with little or no displacement of current fishing effort. According to the socioeconomic analysis, the primary areas fished on the north side of Santa Rosa Island are farther east than the proposed MPA. In addition, as discussed in Response to Comment 5, MPAs have not been shown to lead to congestion-related impacts in other areas. Because no significant project-related environmental effects are expected, no mitigation is required under CEQA. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts.

The commenter suggests that a "complete and accurate" analysis of project-related impacts on fish populations "can only be developed by including spatial harvest information of the fishery participants in the project area." This type of information is exactly the type that was used in the socioeconomic analysis (Leeworthy and Wiley 2002). Fishing effort was described within 1 by 1 minute blocks of Latitude and Longitude. These spatially explicit data were then used to determine potential impacts to various fisheries. Based on this information the Department feels that displaced effort from the rock crab fishery will not lead to negative environmental impacts. It is also important to note that economic impacts to fishery participants are not environmental impacts under CEQA. Moreover, the Department is unaware of any evidence that project-related economic impacts are indicative of significant adverse impacts on the environment or on fish populations. For additional information on potential socioeconomic impacts see Responses to Comments 5 and 12. Finally, for other additional relevant information, please see Response to Comment 72

Comment 112: The Draft ED makes numerous assumptions on reserve theory, which are not supported by substantial evidence in the record. The Science Advisory Panel concluded that large closures would be effective in the CINMS because large closures were effective elsewhere.

Response 112: The Department disagrees that the Draft ED rests on unsupported assumptions. The SAP recommendation to include between 30 and 50% of all habitats was based on the review of published scientific articles. Among those articles were

studies of large fisheries management closures, as well as small and large Marine Protected Areas (e.g., Roberts et al. 2001; Stevens and Sulak 2002; Murawski et al. 2000; McClanahan and Kaunda-Arara 1996; Ratikin and Kramer 1996; and Russ and Alcala 1996b). The SAP=s conclusions were directed at meeting only two goals, ecosystem biodiversity and sustainable fisheries. The conclusions were based on both empirical evidence and theory found in the bulk of the articles. The SAP=s conclusions were not based, as the commenter suggests, on the fact that Asince large closures are effective...off the George=s banks, large closures should be the primary tool for managing 119 species at CINMS.@ A discussion of how the SAP reached this conclusion is found on pages 5-6 through 5-17 of the Draft ED. The Department=s recommendation concerning the proposed project, while using the SAP recommendation as a guide, differs with respect to the percentage included. In integrating other goals and objectives, such as economic and social concerns, the Department chose a smaller percentage set aside. The Department also determined MPAs would be integrated with other management measures in order to best meet all the project goals. See also Response to Comment 16.

Comment 113: The Department is using a percentage based approach to determine reserve size.

Response 113: The Department disagrees. See Response to Comment 97.

Comment 114: The Science Advisory Panel used habitat as a proxy for species distribution; this resulted in hidden environmental and economic impacts due to the actual distribution and concentration of species being much more compressed than assumed.

Response 114: The Department disagrees that use of habitat as a proxy for distribution translates into actual physical impacts. Indeed, the establishment of MPAs within the project area is not expected to result in any significant adverse impacts. This expectation would not change based on the relative concentration of species. If a species concentration was more Acompressed@ within a habitat, it would receive even more protection within an MPA. As long as the network of MPAs includes a portion of an individual species habitat, as suggested by the SAP, an equivalent portion of the population will be included in MPAs. Two types of species would be expected to show a compressed concentration; benthic species that are relatively sedentary, and benthopelagic species (species in the water column that are associated with bottom habitats) with little adult movement or schooling behavior. As noted in Parish (1999), benthic species Aare good candidates for achieving near virgin biomass levels in reserves but not likely candidates for improvement of fishery yields....@ The second part of this statement is not always true. The George=s bank scallop experience is a good example of a benthic species with improved fishery yields outside an MPA (Murawski et al. 2000). Parish (1999) also notes that benthopelagic species Aare the most likely candidates for primary management by marine reserves....@ Based on the published literature it is expected that species with compressed distributions would

actually receive more benefits from MPAs, not negative impacts. In its review of the SAP proposal, the Pacific Fisheries Management Council Science and Statistics Committee (SSC 2001) specifically stated, "the Science Panel operated under the premise that the inclusion of habitats in proportion to their occurrence...could be expected to provide broad ecosystem protections.... The SSC considers the Panel's approach to addressing the biodiversity goal to be reasonable...." The estimates of potential economic impact are based on the actual distribution of ex-vessel value, not the distribution of habitats. The distribution of value is based on direct input from the user groups. The proposed project is based on a combination of both the potential economic impacts and potential environmental benefits. See also Response to Comment 16.

Comment 115: The Science Advisory Panel concluded that three separate biogeographic regions are contained within the project area. None of the 119 species emanates from or exhibits characteristics unique to the transition region. By substituting biogeographic region for species range, the number of MPAs is unnecessarily increased.

Response 115: The Department disagrees that the use of biogeographic regions in describing the project area unnecessarily increased the number of MPAs. As noted in Table 5-2 on page 5-16 of the Draft ED, seven ecological criteria can be used to determine the number and size of MPAs in a network. This includes representing critical habitats, including areas inhabited by species of concern and at critical life history stages, including vulnerable habitats, as well as replicating reserves within the bioregions. This replication is based on total area and the desire to represent a percentage of the habitats within that area. Therefore, if a single bioregion was used as opposed to three, the total number of reserves within that bioregion would be greater due to its greater total area and need to represent a greater variety of habitats. In addition, the total number and spread of reserves was influenced by other factors, including providing insurance that a single catastrophic event would not impact all reserves at the same time. By definition, a transition zone contains representative species of both of the biogeographic regions it separates. The fact that the species found in the transition zone show characteristics of either the warmer Californian biogeographic region or the colder Oregonian biogeographic region indicates that a transition area exists.

Comment 116: The Science Advisory Panel incorrectly concluded that 119 species were in need of and would receive additional protection from MPAs. 57 of these species are fully protected and of the remaining 62 only 33 are not shelf or nearshore rockfish.

Response 116: The SAP made no such conclusion. The "Species of Interest" includes species that meet one or more of the following criteria: 1) species of economic and/or recreational importance, 2) keystone or dominant species, 3) candidate, proposed, or listed species under the Endangered Species Act, 4) species which have

exhibited long-term declines in harvest and/or size frequencies, 5) habitat forming species, 6) indicator or sensitive species, or 7) important prey species. This list was developed jointly by the MRWG, Department and Sanctuary staff, and the SAP. The MRWG agreed to the final list in public meetings. Fully Protected is a legal term that prohibits all take and applies to very few of the species (permits are not authorized). Of the 119 species identified, regulations prohibit take of 22 without special permits. These include: 2 surfgrass species, eelgrass, 5 abalone species, cowcod rockfish, bocaccio rockfish, canary rockfish, yelloweye rockfish, giant seabass, broomtail grouper, garibaldi, tidewater goby, California brown pelican, snowy plover, California least tern, harbor seal, northern fur seal, and southern sea otter. The remaining 97 species, including shelf and nearshore rockfishes, have various levels of protection but all allow some take (Draft ED Chapter 4). Also, the commenter apparently implies that a protected status in law equates to actual protection in the environment, and so the proposed project is unnecessary or duplicative. However, such existing legal protections are neither self-enforcing, nor are they adequate to provide the level of protection sought by the proposed project.

Comment 117: The Science Advisory Panel assumed that fishery management at the CINMS is poor or nonexistent.

Response 117: The Department disagrees with this statement. The SAP specifically stated it ~~Arecommend[ed]~~ maintaining the current fishing effort (or enforcing sustainable levels of fishing) outside marine reserves[@] (SAP recommendation included in Department Recommendation to Fish and Game Commission, Volume 5, 2001). This statement implies that existing fisheries management is at or near sustainable levels and should continue as such. The SAP recognized the importance of existing fishery management in their recommendation. The SAP specifically recommended that existing fishery management be maintained outside MPAs in order to prevent overfishing. Although the SAP recognized that existing management is not sustaining all species in the region, it did not state that management was poor to nonexistent.

Comment 118: The generally accepted range of percentage for reserve size is as follows: a) monitoring reserves 1-10%, b) Added precaution in fishery management 10-20%, c) Alternative fishery management and stock rebuilding 20-50%. In light of groundfish closures, stock rebuilding appears unnecessary and redundant.

Response 118: The Department disagrees. The groundfish closures are directed at rebuilding specific species of groundfish, not at a wide range of other species. In addition, these closures are based on annual assessments and could be removed if assessments change. Within the project area several other species show declining population trends and would likely benefit from additional protection. Though not formally designated as overfished and in need of stock rebuilding, declining population trends indicate a need for added precaution. In the nearshore finfish complex declines have been noted in brown rockfish, copper rockfish, olive rockfish, cabezon, surfperches, and others. Many finfish species abundances are unassessed and

unknown. Abalone in general, and white abalone in particular, are at extremely low levels. There is a wide range of scientific guidelines on what percentage area is appropriate for a given goal. This comment seems to be referring to Parrish (1999), which uses the described range in its introduction. The goals listed in this comment are related to fisheries management, and they fit within the generally accepted range. Other goals, such as natural heritage, ecosystem biodiversity, and ecological function result in different ranges. The proposed project would encompass 19% of State waters and thus falls within Parrish's (1999) range of a precautionary approach not stock rebuilding or alternative management. The proposed project also addresses ecological goals that do not relate directly to stock rebuilding or fisheries management. Finally, the proposed project does not attempt to achieve a particular percentage goal, but instead focuses on adequate representation of habitats within bioregions. See also Responses to Comments 79 and 97.

Comment 119: The Draft ED fails to consider an alternative that meets the requirements of the MLPA with representative habitat as the objective.

Response 119: The Department disagrees. The commenter asserts that the Sanctuary Advisory Council forced the SAP and MRWG to consider only complete no-take reserves. While the MRWG chose to consider only no-take reserves, the proposed project includes State Marine Conservation Areas, which allow limited take. The commenter asserts that the SAP was instructed to assume that fishery management in the project area had failed. No such instruction was given and, as noted in Response 117, the SAP did not make this assumption in their recommendation. The commenter asserts that the SAP assumed that the project area and all its biotic organisms were isolated at the CINMS. While the SAP focused their discussion on the Sanctuary area, this did not exclude discussions of how the project area was impacted by outside forces. In particular, the oceanic current patterns of the entire Santa Barbara Channel were discussed in order to determine potential for export from MPAs. Finally the commenter asserts that reserve designers were forced to design reserves for 119 species of concern that were selected in an arbitrary method. The Department disagrees with this contention. The species-of-interest list was developed based on a set of seven distinct criteria (See Response 116) not by an arbitrary method. In addition, due to the lack of knowledge regarding the range and distribution of many of these 119 species, a habitat based approach to reserve design was used rather than a species distribution approach. The proposed project represents and replicates a wide range of habitats within the project area, as noted in Chapter 5 of the Draft ED. Each alternative represents varying amounts of habitat including higher and lower levels of representation. The goals of the proposed project include not only the MLPA goal to represent habitat, but also the other goals of the act. These goals are not ranked in the MLPA and are seen as an overall framework for the State's MPAs. They include: protection of natural diversity and abundance; helping to sustain conserve and protect marine life; improvement of recreational, educational and study opportunities in areas subject to minimal human disturbance; and protection of marine natural heritage, including representative habitats. Taken together, the Department

disagrees with the suggestion that the Draft ED fails to include a "full range of alternatives." The Draft ED, in fact, includes a reasonable range of alternatives to the proposed project that facilitate meaningful environmental review, as well as fostering informed decisionmaking and public participation. In this respect, the alternatives addressed in the Draft ED comply with the obligations in section 781.5 of Title 14 of the California Code of Regulations, as well as the "rule of reason" governing required analysis of alternatives under CEQA generally. See also Response to Comments 97 and 79.

Comment 120: Expresses general support for Alternative 6 (defer decision).

Response 120: See Response to Comment 20.

Comment 121: Expresses general support for the proposed project.

Response 121: Comment noted.

Comment 122: The final document should acknowledge new management measures for rockfish that have occurred or may occur.

Response 122: See Response to Comment 76.

Comment 123: The proposal to reopen a portion of the Cowcod Conservation Area may no longer be consistent with rockfish management.

Response 123: The Department agrees. The proposal to reopen a portion of the Cowcod Conservation Areas was included to provide recreational fishing opportunities on the continental shelf by replacing a portion of those opportunities lost through the proposed project. Given that the shelf is now closed to fishing activities that may impact groundfish, changing the Cowcod Conservation Areas may be inconsistent with Federal regulations. The Department, as a result, intends to recommend to the Commission that it not adopt this portion of the proposed project. There are no changes to the potential environmental impacts associated with this recommendation and the Department believes this change will not result in any significant environmental impacts.

Comment 124: Another resource management concern is the lack of protection of seabirds in critical breeding and roosting areas.

Response 124: While seabirds may receive some added protection through the placement of MPAs, this protection is not the primary purpose of MPAs. Many seabirds are affected by disturbance caused by human activities. Since the proposed project does not exclude access to MPAs, the overall level of activity would only be reduced by the number of vessels that no longer access an area for fishing. Non-consumptive uses, transit, and anchoring are not prohibited. The Department believes that seabird breeding and roosting area protection is better handled through other management

strategies. Even so, the Department believes that approval and implementation of the proposed project will not cause any potentially significant impacts on the species or the habitat identified by the commenter. In fact, the Department believes such species will actually benefit from the additional protection afforded by the proposed project. Finally, the Department welcomes NOAA's commitment to joint agency efforts to address "potential human threats in these areas and [to] develop strategies to protect seabirds." See also Responses to Comment 16 (regarding adaptive management) and Comment 17.

Comment 125: The final document should discuss existing and/or planned biological and economic monitoring and plans for enforcement.

Response 125: See Responses to Comment 110 (regarding biological monitoring) and Comment 17 (regarding MOUs).

Comment 126: The final document should include more detailed discussion of how MPAs will be integrated into fisheries management.

Response 126: The Department disagrees. The role of MPAs in fisheries management is more appropriately addressed through the fisheries management process of the MLMA. See also Response to Comment 4.

Comment 127: The Project is inappropriately segmented in the analysis. It does not give adequate attention to the impacts of the MLPA.

Response 127: The Department disagrees. See Response to Comments 104 and 107.

Comment 128: The proposed project should be implemented as a pilot or test case.

Response 128: The Department agrees. The Draft ED notes on page E-3 that ^{aa} timely decision will provide needed insight and experience in the implementation of reserves before the MLPA suggest MPAs for the entire State.[@] Given the present timeline for the MLPA public process, Channel Islands MPAs can function as a test case for both implementation and monitoring.

Comment 129: The document does not reference any scientific papers that deal with the problems of congestion of fishing effort or zonal management. There are no resources cited in support of social geography, cartography, anthropology, community-based management, societal and ethical values, etc.

Response 129: The Department disagrees. The Draft ED references papers dealing with potential problems of MPAs on pages 1-14 through 1-17. It also discusses the potential for congestion of fishing effort and the reasons why this potential congestion is not expected to lead to significant adverse environmental impacts at pages 5-17

through 5-18. Environmental ethics and potential benefits to communities are discussed on pages 1-11 through 1-14. As to other non-CEQA issues, the Department welcomes any and all input regarding policy issues that serve to foster informed decisionmaking and the sound exercise of policy discretion by the Commission.

Comment 130: The document fails to analyze CalCOFI larval survey data to explain source and sink populations.

Response 130: The Department disagrees that the referenced survey can be used to identify sources and sinks. A source population is a population in which the birth rate exceeds the death rate, and the young survive to grow and reproduce at their birthplace and other places in the region. A source population supports other populations in the region that are not as productive. A sink population is a population in which the death rate exceeds the birth rate, and the persistence of the sink population depends on recruitment from source populations elsewhere.

Various types of data, including the size of the adult population, the average production per adult, the rates of survivorship (or mortality) of young and adults, and the potential for dispersal of young and adults, are needed to identify sources and sinks. In addition, these demographic rates exhibit temporal variation. Over time, source populations may become sink populations and vice versa.

The CalCOFI database includes 66 stations off Southern California. Only one of these stations is within the Sanctuary boundary and four surround the project area to the north and south. The data provided by CalCOFI surveys are useful to estimate the relative abundance of various species throughout Southern California, as well as some of the factors that may influence the distributions of species. However, the data cannot be used to identify sources and sinks.

Comment 131: The document inadequately discusses the ecological science framework and tradeoffs of designing marine reserves to protect species at the edge of their ranges.

Response 131: The Department disagrees. The ecological science framework and tradeoffs describe in the Draft ED would not differ for species at the edge of their range. Reserves have localized, as well as regional, effects. In general, the abundance of organisms increases in marine reserves relative to fished waters, even if those species are at the edges of their ranges. For example, both California spiny lobster (*Panulirus interruptus*) and California sheephead (*Semicossyphus pulcher*) are at the northern end of their common range in the Channel Islands. In both cases there is evidence that a small no take reserve at Anacapa Island provides local benefits to these species. Lobster are six times more abundant and larger than those in surrounding waters and sheephead are three times more abundant (M. Behrens and K. Lafferty, analysis of NPS data).

The effects of reserves on species at the edges of their ranges also depend on the direction of prevalent currents in the region. Reserves may contribute to regional production if prevalent currents travel from the edge of the species= distribution, through the reserve, and toward the center of the species= distribution. Currents in the Santa Barbara Channel are known to form a cyclonic eddy traveling west along the mainland and east along the north side of the islands. The locations of reserves in the proposed project were influenced by local production, as well as their potential contributions to the region based on the patterns of circulation. Reserves may not contribute much to regional production if currents move through the reserve and away from the center of the species= distribution. At certain times of the year, currents may flow out of the Santa Barbara Channel to the west. During this period, reserves located around the western islands may not contribute to regional production. See also Response to Comment 16.

Comment 132: The Document does not provide detail on long term monitoring plans.

Response 132: See Response to Comment 110.

Comment 133: The document ignores the NRC Report's findings that quality habitat should be set aside as opposed to a pre-determined percentage goal.

Response 133: The Department disagrees with this statement. The NRC, in their report Marine Protected Areas: Tools for Sustaining Ocean Ecosystems addresses critical and vulnerable habitats, not Aquality habitat@. See Response to Comment 97.

Comment 134: The Proactive Fishermen's Plan (Alternative 2) selects the best quality areas for no-take MPAs as a phase 1 pilot project. The plan is based on the idea that effective enforcement along with careful monitoring and evaluation will inform phase 2 for the purposes of adaptive management.

Response 134: Though the measurement of habitat quality is subjective, the Department generally agrees with this approach. As noted in Response 79, the proposed project represents and replicates a wide range of habitats within the project area (see Draft ED Chapter 5). Each alternative represents varying amounts of habitat including higher and lower levels of representation. The goals of the proposed project include not only the MLPA goal to represent habitat, but also the other goals of the act. These goals are not ranked in the MLPA and are seen as an overall framework for the State's MPAs. They include: protection of natural diversity and abundance; helping to sustain conserve and protect marine life; improvement of recreational, educational and study opportunities in areas subject to minimal human disturbance; and protection of marine natural heritage, including representative habitats. Further, many of the same or substantively the same habitats and locations are included in both the proposed project and Alternative 2. Overall, the proposed project overlaps Alternative 2 by 78 percent. This is especially true in nearshore areas. In addition, the proposed project includes habitats around Santa Barbara Island that are not included in Alternative 2.

One way of determining the relative value of an individual area is to consider the number of habitats within that single area (habitat heterogeneity). Figure 8-1 depicts the overlap of the proposed project and areas of highest habitat heterogeneity. These areas include breeding sites, marine mammal haul outs, rare habitats, and critical habitats for various species of interest. In light of these considerations, Alternative 2 does not achieve project goals and objectives to the same extent as the proposed project. In contrast to the comment, phasing is not specifically prohibited by the proposed project. The Fish and Game Commission may, in fact, exercise its discretion and decide to implement portions of the plan prior to others. A detailed description of potential phasing is provided in Attachment 8 to the Initial Statement of Reasons for Regulatory Action for the proposed project. See also Response to Comment 15 for a discussion of phasing. A review of this description has been added to section 3.2.2 of the Final ED.

Comment 135: The document should analyze whether existing fisheries management is adequate to protect the species of interest.

Response 135: The Draft ED analyzes the adequacy of existing fisheries management. Chapter 4 of the Draft ED lists the status of species in the project area. In many cases these species are in a state of decline. For the species of interest, four finfish are considered overfished by the Pacific Fishery Management Council and many other finfish populations have not been formally assessed but are considered to be in downward population trends. White abalone, in turn, is listed as an endangered species and black abalone is proposed for listing. Based on the above facts, it is clear that traditional management alone has not been sufficient to protect some groundfish and other populations. One goal of MPAs is to provide insurance for management uncertainty by providing areas where species can interact in a relatively undisturbed ecosystem. Finally, the Department rejects the implied notion that MPAs should not be used as a marine resources or fisheries management tool absent extensive scientific study indicating that all other management tools are failing or ineffective. The Department appreciates and understands opposing view points on this issue, however, and comments to this affect are part of the administrative record of proceedings that will be presented to the Commission for its consideration prior to any final action regarding the proposed project. See also Responses to Comment 4 and Comment 16.

Comment 136: The species of concern list was not a consensus product of the MRWG and was developed by the Sanctuary and Department.

Response 136: The Department disagrees. The [Species of Interest](#) list was developed jointly by the MRWG, Department and Sanctuary staff, and the SAP. The final list was agreed to by the MRWG in public meetings.

Comment 137: What negative impacts on fishery stocks, habitat, and harvest are a consequence of squeezing the same number of fishermen into (for the preferred alternative) 75% of the fishing space?

Response 137: The Department does not feel that approval of the proposed project will lead to significant adverse impacts on stocks, habitat, or harvest due to congestion. In addition, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts.

The commenter specifically cites two papers as evidence of potential negative impacts on harvest (Anderson 2000; Parrish 1999). Anderson (2000) is not a peer reviewed study. It combines the use of economic revenue curves and biological models. The paper ignores the fact that reproductive potential within reserves increases dramatically.

In addition it ignores the fact that other fisheries management, including reductions in fleet capacity and Total Allowable Catch will also address potential impacts to sustainable harvest levels. The structure of the model guarantees that any situation including reserves will necessarily have lower fishing yields than a system without reserves. The problem is that the model of population growth is essentially a logistic growth model where there is no production of new fish once the population is at carrying capacity. Since all reserves reach carrying capacity quickly in the absence of fishing, they contribute nothing to population growth in the model. Quite the contrary, there is widespread evidence that the larger individuals commonly found within reserves have substantially higher fecundity than smaller adults outside. If this component is excluded from consideration, the model has little relevance to reserve design.

In the second model of this paper, adults are allowed to move out of the reserve. This provides a mechanism for increased abundances in the reserve to benefit fishing beyond the reserve boundary. The model shows the obvious result that as the rate of adult movement increases, the optimal fishing yield converges on the no reserve fisheries case. This convergence is simply because if adults move rapidly and freely beyond reserve boundaries, closing a given area to fishing is identical to reducing overall fishing mortality until it protects an equivalent fraction of the population. Again, this result is already well known. In the highly mobile situation, controlling the number of fish caught using space or effort restrictions become equivalent as Hastings and Botsford (1999) have already demonstrated in a much more general form.

Parrish (1999) discusses potential impacts of reserves used as an alternative strategy for sustainable development in the range of 20-50% of area set aside and particularly reserves at or above 35%. Parrish (1999) also states that reserves in the range of 5%-20% used as a buffer or insurance against overfishing are beyond the simple analyses presented here and not addressed. The proposed project falls into the high end of this range at 19% of State waters. Even so, the perceived potential for negative impacts can be addressed. The discussion above indicates that simple models may

not adequately include changes in fecundity that will lead to fisheries benefits outside MPAs, particularly for species that have shorter adult dispersal distances. See also Response to Comment 5.

Comment 138: The document does not consider the impacts of individual areas on displacement of the lobster fishery particularly on the North side of Anacapa Island and the Northeast side of Santa Cruz Island.

Response 138: The Department does not feel the proposed MPAs would have a significant socioeconomic impact on the lobster fishery or lead to a negative impact to lobster fishing habitat. The maximum potential loss estimated for these two areas is less than 1% of existing catch, based on analyses of landings figures and location data provided by lobster fishermen (Leeworthy and Wiley 2002). This is primarily due to the fact that lobster fishing is already limited by the existing Anacapa Island Ecological Reserve Natural Area on the northeast side of Anacapa Island and the fact that lobster trapping would be allowed in the proposed Anacapa Island State Marine Conservation Area on the northwest side of the island. Habitat for lobster trapping would also remain available at the extreme northeast end of Santa Cruz Island and in the more protected waters to the west of the proposed Scorpion State Marine Reserve. Department landing data show that lobster catch is distributed through all Fish and Game Blocks around the northern Channel Islands. See also Response to Comment 5.

Comment 139: The proposed project disproportionately impacts the red crab fishery.

Response 139: See Response to Comments 72 and 5.

Comment 140: The proposed project closes a significant portion of the kelp beds, thus disproportionately impacting sea urchin fishermen and not meeting its objectives.

Response 140: The Department disagrees. Project-related economic and social effects are not environmental impacts per se for purposes of CEQA. The proposed project includes 21% of available kelp forest habitat. The overall maximum potential economic impact to the sea urchin fishery is estimated at about 16%. This maximum potential economic impact is based on the assumption that any revenue currently generated in areas proposed for MPAs will not be replaced by redirected effort in other areas. It ignores fishermen's abilities to change fishing locations in order to compensate for the regulatory change. In balancing the objectives to minimize economic impacts (shown by a 16% potential economic impact with a 21% area closure) and to promote ecosystem biodiversity, the proposed project necessarily has higher economic impacts to certain types of fishing. Thus the proposed project more completely meets the range of goals and objectives as a whole, rather than a subset of them.

Comment 141: The proposed project would restrict white seabass and halibut fishing by an additional 25% without mitigation.

Response 141: The comment assumes that the entire area within MPAs of the both the State and Federal phase is currently used by these fisheries. The estimated maximum potential loss in income to flatfish fishing as a whole is about 12%; halibut is a subset of this group. The estimated maximum potential loss in income to sculpin and bass fishing is about 11%; white seabass is a subset of this group. It is inappropriate to sum these economic impacts in order to come up with an economic impact to the two fisheries combined. A specific adjustment to the working draft of the proposed project was made to help reduce economic impacts to the drift net fisheries by moving the boundary of the proposed Carrington Point Marine Reserve closer to shore. See also Response to Comment 5 regarding mitigation for socioeconomic impacts.

Comment 142: The document does not discuss the prospect of increased foreign competition for market share and potential cumulative impacts to marine resources as a result of "accelerating competition and transfer of effort to another region of the same ecosystem, the California Bight in Mexican waters."

Response 142: Increased competition for market share is usually discussed in reference to a time period when local production is significantly reduced or prohibited so that it does not meet demand. This is true for fisheries completely closed during specific time periods. The intent of the proposed project and MPAs generally is to provide for continued sustainable use. In this respect, the Department believes the proposed project will facilitate and maintain the ability to provide local production. Stated another way, the Department does not believe the proposed project will "preclude local fisherman from competing in the now-undercut wholesale prices of heavily overexploited fish stocks in the Sea of Cortez and Baja's Pacific Coast in California markets." See also Responses to Comments 5 and 12 regarding mitigation for socioeconomic impacts.

As to the comment regarding cumulative impacts, the Department disagrees that the proposed project will result in the transfer of fishing effort internationally such that significant, project-related cumulative impacts in Mexican waters occur. As detailed in Response 5, the Department believes that the proposed project will not result in direct or reasonably foreseeable indirect significant impacts on fish populations outside of the areas covered by the proposed project. For the same reason, even though the Department acknowledges the adverse condition of certain fisheries in Mexican waters, we disagree that the proposed project will cause an adverse, cumulatively significant incremental contribution to the existing condition of the Mexican and/or international fishery.

Comment 143: The Draft ED fails to provide "management context" under CEQA for Project Alternatives, which "masks" significant environmental impacts.

Response 143: The Department disagrees that "management context" for alternatives to the proposed project are required under CEQA and that the alleged failure to do so "masks" project-related environmental impacts. The Commission's certified regulatory

program governing preparation of the Draft ED requires the Department to include reasonable alternatives to any recommendation made to the Commission [Cal. Code Regs., tit. 14, 781.5, subd. (a)(2)]. In the present case, the proposed project is the Department's recommendation to the Commission. The Draft ED, in turn, in Chapter 6, addresses and describes seven alternatives to the proposed project. In the Department's opinion, the alternatives presented fulfill the obligation under CEQA to provide a reasonable range of project alternatives sufficient to foster informed decisionmaking and public participation. The commenter does not appear to contend that the range of alternatives considered in the Draft ED fails to pass muster under the rule of reason.

The commenter asserts that "management context" is required for an appropriate assessment of project- and alternative-related environmental impacts. The Department agrees that fishery management considerations are relevant to the Commission's exercise of discretion with respect to the Department's recommendation and alternatives to the proposed project. CEQA, however, requires the Draft ED to assess project-related environmental impacts, as well as the comparative impacts of the various alternatives, based on the existing physical conditions in and around the project area at the time the Department commenced review of the proposed project under CEQA (See generally Cal. Code Regs., tit. 14, Section 15125). The Draft ED complies with this requirement. The Department, as a result, disagrees that the alternatives discussion in the Draft ED is inadequate under CEQA absent a more detailed overview of "management context." The Department, for the same reason, also disagrees with the statement that the existing alternatives analysis "masks" significant project-related environmental impacts. The commenter, in turn, in offering an opinion, presents no substantial evidence that the proposed project or the alternatives will result in currently unidentified significant environmental impacts.

Finally, the commenter also contends that: (1) the "methodology of the supporting science" in the Draft ED is "flawed" and "fails to meet project objectives"; (2) the Draft ED "omits essential fishery information necessary for evaluating these objectives"; and (3) the Draft ED "fails to provide adequate scope to its range of alternatives for consistency with the MLMA [and] MLPA." The commenter, however, offers these comments without any supporting analysis, cross-references to the Draft ED, or any substantial evidence. The Department disagrees with the commenter for this reason, noting that the Draft ED provides a detailed description of the proposed project, analysis of whether the proposed project will result in significant environmental impacts, and an overview and comparative analysis of a reasonable range of project alternatives. The Department notes, however, that all public and agency comments will be presented to the Commission for its consideration prior to taking any final action on the proposed project. For additional information regarding the proposed project, and existing and emerging management practices, please see Response to Comment 108.

Comment 144: The Draft ED fails to support the strategic implications of placing the highest density of fishery closures on the west coast in the CINMS based on biological

criteria or sustaining yield. The final document should discuss what biological performance standards will be used to measure performance.

Response 144: The Department disagrees with the statement that the Draft ED fails to support its conclusions based on biological criteria or sustaining yield. The biological criteria used to develop the proposed project are described in detail in Section 5.3.1 on pages 5-6 through 5-18 of the Draft ED. Pages 5-7 through 5-9 in this section address specifically the implications of reserves for fisheries (i.e., sustaining yield). If the discussion of MPAs is broadened to the more general category of Afishery closures@ the proposed project is significantly smaller than several other closures. These would include the Cowcod Conservation Areas and the recent fishery closures on the continental shelf, both of which cover huge amounts of area and 100% of various habitats, an obviously more dense concentration. Overall MPA performance will generally be judged based on how well the proposed project meets its defined goals and whether the expected ecological benefits occur. The specific standards for measuring performance would vary depending on the final choices for whatever alternative network is implemented. See also Response to Comment 17.

Comment 145: The proposed project does not consider the relative scale of reserve size compared to island size and use patterns.

Response 145: The Department disagrees. The relative size of individual MPAs within the proposed project is indicative of the habitat-based approach used to develop the proposal, as well as the multiple goals and objectives. The fact that a higher density of reserves is found at each end of the island chain is supported by the distribution of critical habitats (see Figure 8-1). The proposed project attempted to include the most heterogeneous habitat regions in order to reduce the overall area. Each MPA is intended to function in conjunction with the network as a whole and is sized and located based on an effort to reduce potential economic impacts while still including important habitats and maximizing ecological benefits. See also Response to Comment 79.

Comment 146: A better way to assess a reserve=s representation of habitats is to use relative heterogeneity of ecological features. The document fails to consider the relative heterogeneity of ecological features within reserves.

Response 146: The Department agrees with the approach of looking at relative heterogeneity of habitats, but disagrees that the document fails to consider this. Part of the scientific basis for selecting core reserve areas was focused on areas that included the maximum number of habitats within the smallest total area (heterogeneity). The development process included a scientific model that encouraged using the most heterogeneous areas to reduce the total area required. The summed results of the model are shown in Figure 8-1 and are overlaid with the boundaries of the proposed project. This figure demonstrates that the proposed project includes some of the most heterogeneous habitats. It also shows how certain highly heterogeneous areas were

excluded based on other criteria such as reducing economic impacts. See also Response to Comment 79.

Comment 147: A variety of options for phasing are provided and should be presented in the final document.

Response 147: See Response to Comment 15. For clarity, the phasing alternatives as discussed in the Initial Statement of Reasons have been added to the description of Alternative 2 in the Final ED (Section 3.2.2, pages 3-13 through 3-14). The commenter also provides additional information on phasing alternatives. This information can be found in the reproduction of the comment (L-13-22) in Section 8.3 below. According to the comment, “An integration-focused” phasing would not occur until “A[r]estricted access, capacity goals, and regional data management program(s)” existed and “Aessential fisheries information baseline (is) programmed and in place.” The Department feels that these types of standards would be too restrictive and not allow for adaptive management based on potential benefits or changes to population status. According to the comment, “Atime sequential phasing” would not occur without baseline monitoring and fisheries impact monitoring. The comment states that, in “Atime sequential phasing,” the second phase would occur ten years after the first, or two reserves would be phased in every five years. The Department agrees that timed based phasing could potentially lessen short term economic impacts and might allow for research on the first phase. The Department feels that the actual length of time between phases should not be based on performance criteria or life history parameters that may not be known or understood. The comment states that “Asunset clause” phasing would be tied to “Arigorous accountability.” Most of this option is based on removing reserves if certain budget parameters are not met. The Department believes that although MPAs should not be implemented without appropriate funding, the specifics of such an option are impractical given the State budget process. In addition certain recommendations within the comment (e.g., establishing commissions) are beyond the authority of the Commission. The comment lists three options for “Aeconomic impact” phasing. The Department feels that each of these options ignores the potential economic impacts of the status quo and the potential economic benefits of the proposed project as discussed in Section 6.8.2 on pages 6-68 through 6-74 of the Draft ED. Finally the comment states that “Anatural history and peoples eco-park” phasing would occur based on the ability of the public to access the areas and the existing abilities for monitoring and enforcement. The Department disagrees with this option because it addresses only one of the goals of the proposed project: to allow for recreational activities in areas minimally disturbed by human impacts. It does not address the goals of ecosystem biodiversity or sustainable fisheries and it could lead to negative economic impacts due to continuation of current population trends or lack of potential MPA benefits to fisheries.

Comment 148: Expresses general support for the proposed project.

Response 148: Comment noted.

Comment 149: The document is legally sufficient under CEQA.

Response 149: The Department agrees.

Comment 150: The document does not sufficiently describe the potential impacts of alternative 6 (defer) and 7 (no action).

Response 150: See Response to Comment 20.

Comment 151: A more thorough treatment of the environmental effects of the project is desirable.

Response 151: The Department believes that the treatment of environmental effects of the project is adequate. The proposed project is based on a concept of ecosystem management and is intended to provide ecological benefits. The potential benefits and costs of the proposed project are described in detail in Chapter 5. Information on the potential impacts of no action or deferring to the MLPA process is discussed in the Response to Comment 20.

Comment 152: The executive summary should more extensively analyze each alternative with respect to the ecological criteria in Section 5.3.1.

Response 152: Additional language has been added to the executive summary to reflect changes in the analysis of alternatives. These changes reflect the potential impacts to the environment for the no action alternative that have been added to chapter 6 and are described in the Response to Comment 20.

Comment 153: More detail should be provided in section 6.6 on how deferring to the MLPA will not meet the goals or objectives of the proposed project.

Response 153: Detail has been added to the Chapter 6 and the executive summary on how the goals of the project are not met, and there is a potential for long-term negative impacts of both the no action and defer to MLPA alternatives.

Comment 154: Taking no action and deferring to the MLPA are substantively the same and should be combined as a single alternative.

Response 154: The Department disagrees. While taking no action and deferring to the MLPA process are substantively the same in the short term, the long term implications may not be the same. A deferral to the MLPA process was added as a reasonable alternative based on public comment. The intent of this alternative was to indicate that some action would be taken at a later date. The intent of a no action alternative is that no action will be taken on the proposed project in the foreseeable future. Therefore, the Department believes that while deferring to the MLPA process will have relatively

unknown results, it is different than taking no action. See also Response to Comment 20.

Comment 155: The Department is correct in its assertion of no significant environmental impacts.

Response 155: The Department agrees.

Comment 156: Section 5.3 should be reorganized to make it clearer that parts are the ecological criteria used to draft the proposed project and parts are an analysis of how the proposed project meets those criteria.

Response 156: The Department agrees. Chapter 5 has been reorganized and edits made to clarify the chapter.

Comment 157: The criteria for habitat representation comparisons on 5-12 should be more completely explained.

Response 157: See Response to Comment 55.

Comment 158: A table or set of tables comparing the habitat representation of each alternative within each biogeographical region and each habitat type would be helpful.

Response 158: Table 6-56 on page 6-66 and pages 6-74 through 6-75 of the Draft ED compare the proposed project and each alternative on the bases of total area percentage representation of each habitat. The discussion on pages 6-74 through 6-75 has been moved to page 6-66 and an additional table has been added to this section to show the overall representation of each alternative by bioregion.

Comment 159: The final document should include analysis of how each alternative meets the criteria of including existing monitoring sites, as well as information on the level of existing monitoring.

Response 159: The draft document lists the number of Channel Islands National Park Kelp Forest monitoring sites for the proposed project and each alternative on pages 5-30, 6-4, 6-16, 6-28, 6-41, and 6-54 respectively. The existing monitoring programs are listed on page 5-14. A table has been added to page 6-69 of the Final ED comparing other criteria used in developing the proposed project.

Comment 160: The final document should include information on why each alternative does or does not include a multiplier to insure against catastrophes.

Response 160: The rationale for not including additional habitat in the proposed project and each alternative are found on pages 5-31, 6-4, 6-16, 6-29, and 6-41 respectively. This rationale includes the fact that the location of reserves is proposed to reduce the

potential of a single event impacting all reserves at one time, as well as other mechanisms as described in Response 36.

Comment 161: The final document should include a summary table describing the analysis with respect to ecological criteria.

Response 161: Table 6-56 summarizes the habitat representation for the proposed project and each alternative. A new table has been added to page 6-69 of the Final ED to summarize the other ecological criteria.

Comment 162: The final document should include a discussion of why impacts of congestion would not be significant under CEQA.

Response 162: See Response to Comment 5 regarding impacts of congestion.

Comment 163: Where possible, the final document should evaluate environmental benefits of the proposed project and alternatives.

Response 163: The potential benefits are discussed in general on pages 1-11 through 1-14. These benefits are further analyzed in the biological impacts and step 2 economic analysis sections for each alternative found in Chapters 5 and 6.

Comment 164: Other fisheries management activities, including the recent groundfish closures, should be included in the discussion of cumulative impacts.

Response 164: See Response to Comment 76.

Comment 165: The document should be edited by moving information on FMPs to a section discussion the impacts of other fisheries management activities.

Response 165: See Responses to Comments 4 and 108.

Comment 166: If the document=s discussion of economic impacts is edited it should still contain qualitative analyses of long term costs and benefits of the proposed project.

Response 166: The Department agrees. This information is found in Chapters 5 and 6 of the Final ED.

Comment 167: The Fish and Game Commission has clear authority to establish MPAs.

Response 167: The Department agrees.

Comment 168: The final document should fully comply with the federal Endangered Species Act, including provisions of Section 7 consultations.

Response 168: Section 7 does not apply to State actions within State waters. Section 7 of the Endangered Species Act directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the Fish and Wildlife Service, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of Federal lands, as well as other Federal actions, that may affect listed species such as Federal approval of private activities through the issuance of Federal permits, licenses, or other actions. In this process, Federal agencies were contacted and involved at all stages (Draft ED Chapter 7). Species listed as threatened or endangered under the Federal Endangered Species Act are described in Section 4.3.3.8 on pages 4-131 through 4-133 and in Table 4-15 on page 4-133 of the Draft ED. The proposed project would protect habitats for a variety of these species and no "take" is expected.

Comment 169: The proposed project best accomplishes the established goals while minimizing consumptive user impacts.

Response 169: The Department agrees.

Comment 170: The proposed project was specifically sized and located to avoid high use areas while maintaining habitat representation.

Response 170: The Department agrees.

Comment 171: Due to the recent shelf closures documented long-term economic benefits to extractive user groups are substantially understated and the short-term net economic costs are substantially overstated.

Response 171: See Response to Comment 5 regarding socioeconomic impacts. The Department disagrees that the estimates for short term economic costs are dramatically overstated and long-term benefits understated. As noted in Response 76, the June 2002 Pacific Fishery Management Council action to close fishing on the continental shelf for groundfish species will reduce the economic impacts of MPAs on groundfish fisheries in the same region. This is particularly true of the rockfish fisheries. The Department feels, however, that a complete reassessment of potential economic impacts is both infeasible and unnecessary at this time. The existing analysis is based on long term averages that would not be drastically altered by a short-term change in activities. It would also be difficult to estimate changes in use patterns because the shelf closure only recently occurred. Finally, the detailed economic analysis is provided as additional information to inform the decision makers. It is a comparative analysis of the alternatives and the socioeconomic impacts of each alternative would be reduced proportionately. Thus, the overall comparison is not likely to change. Because the shelf closure is a fisheries management regulation that may be modified or removed based on annual stock assessments, the Department does not feel the long-term benefits of the proposed project are altered.

Comment 172: The no project (no action) alternative would not meet the project goals and would have negative impacts.

Response 172: The Department agrees there is a potential for negative impacts in the no action alternative. See Response to Comment 20.

Comment 173: The defer decision alternative is unacceptable as it would allow continued declines in resources.

Response 173: The Department agrees. See Response to Comment 20.

Comment 174: No coastal development permit will be required for the proposed project.

Response 174: Comment noted.

Comment 175: Expresses general support for Alternative 5. Only Alternative 5 meets the Science Advisory Panels recommendations for reserve size. Alternative 5 would protect the largest area and the greatest number of different habitats. Alternative 5 is the only alternative that includes an insurance factor as recommended by the Science Advisory Panel.

Response 175: See Response to Comment 10.

Comment 176: The Department should include discussion of new groundfish regulations including a reassessment of potential socioeconomic impacts which would likely decrease.

Response 176: See Responses to Comments 5, 76, and 171.

Comment 177: The document should clarify the Coastal Commission jurisdiction.

Response 177: The Department agrees. Additional information provided by the Coastal Commission has been added to page 2-7.

Comment 178: The document should expand the discussion of the Southern sea otter and include the most recent population data.

Response 178: The Department agrees. Additional information has been added to page 4-131.

Comment 179: The environmental impacts of existing commercial fishing such as trawling should be discussed along with the potential benefits of marine reserves.

Response 179: The potential benefits of marine reserves are discussed in chapter 1 of the Draft ED. Information on the potential impacts of the no action alternative (which

would allow existing fishing activity to continue) has been added to chapter 6 and is summarized in Response 20. Trawling has been documented as having negative impacts on various bottom habitats (e.g., Rumohr and Krost 1991; and Smith et al. 2000). The proposed project would reduce trawling impacts within the MPAs. This would be an environmental benefit. Likewise, approval of the proposed project is not expected to result in significant environmental impacts associated with trawling.

Comment 180: The economic overview of commercial fishing should be revised based on the new groundfish regulations.

Response 180: See Responses to Comments 5, 76, and 171.

Comment 181: The document's discussion of oil and gas should be expanded and include recent proposals to expand extended reach drilling and discussions of potential impacts of spills.

Response 181: The Department agrees. Additional information has been added to section 4.4.4 regarding oil and gas.

Comment 182: The information on passive use benefits should be expanded.

Response 182: The Department appreciates the California Coastal Commission's suggestions regarding "non-use economic values". Analysis of non-physical social and economic effects, however, is not required by CEQA. In this regard, the Department believes the Draft ED includes more than adequate social and economic analysis to foster informed public decisionmaking and disclosure as those issues concern project-related environmental impacts. Along the same lines, the Department believes the Draft ED includes sufficient social and economic information and analysis to assist decisionmakers in determining whether project-related environmental effects are significant under CEQA. Quantification of passive use values requires the application of complex economic valuation techniques that do not contribute to the determination of whether the proposed project has significant adverse impacts to the environment. See also Response to Comment 12.

Comment 183: It is questionable that there was adequate community involvement to include Santa Barbara Island in the range of alternatives. It is a primary fishery for the Los Angeles and Ventura regions, and there were no community meetings held in the Los Angeles region.

Response 183: The comment occurs in the context of economic impacts to commercial fishermen. Project-related social and economic impacts, however, are not environmental impacts for purposes of CEQA. The port of origin of commercial fishermen fishing off Santa Barbara Island does not change the potential for adverse environmental impacts. See Responses to Comments 5 and 12 regarding socioeconomic impacts and Comment 48 regarding public participation.

Comment 184: The range of alternatives is inadequate because the lower end of the scope has large reserves in the western portion of the project area and little to no reserve area in the eastern portion.

Response 184: The Department disagrees that the Draft ED fails to include a reasonable range of alternatives to the proposed project. The low end of the range is an alternative to maintain the existing level of MPAs in the region, less than 1% of the project area (no-action). The Fish and Game Commission could choose this alternative if, among other reasons, it decides that existing levels of protection are adequate to sustain resources in the project area. Among the spatial alternatives for MPAs the range includes options which cover all the islands or some of the islands in the project area. This provides the Commission with various levels of protection in various areas based on the overall level of protection desired. The Department feels that this range is reasonable based on the goals and objectives of the proposed project and from both an environmental and policy perspective. The comment seems to support the concept used in developing the proposed project and larger alternatives to ensure habitat representation throughout the island chain. It also supports the Department's rationale for not choosing Alternatives 1, 2, or 3 due to their lack of complete habitat representation.

Comment 185: Why does the Department use Alternative 1, the areas of overlap, as the lower end of the range?

Response 185: The no action alternative (Alternative 7) is the low end of the range, representing less than 1% of the project area in existing MPAs. Alternative 1 was included based on input received during the extensive MRWG process as well as comments in the Fish and Game Commission forum. An alternative smaller than Alternative 1, but larger than the status quo, was not included because it would not achieve the project objectives. Specifically, the project seeks to protect representative and unique habitats, natural heritage, and recreational opportunities in areas subject to minimal human disturbance and to help sustain, conserve, protect, and rebuild marine life populations. The smallest alternatives provided in the Draft ED can achieve some of these goals to a limited extent in a portion of the project area and within the individual MPAs. A smaller alternative would be unlikely to achieve these goals in a significant portion of the project area and possibly not within individual MPAs. In addition, the smallest alternatives are not expected to have significant benefits in the long term outside their boundaries.

Comment 186: No action was taken by the Department or Commission to address a request to change Alternatives 1 or 3 due to disproportionate impacts to Santa Barbara harbor and their failure to protect habitat in all three bioregions.

Response 186: While the maximum potential economic impact estimated for Santa Barbara harbor is higher than other ports for Alternatives 1 and 3, this is also true for the other alternatives discussed in the Draft ED. Deleting these alternatives from further consideration, as a result, would not address the concerns of the commenter.

The Department, as a result, interprets the issues raised by the commenter as a generalized concern regarding proximity of the proposed reserves to vessels and commercial fisherman based in Santa Barbara. These concerns, in turn, underscore the importance of the project area to the vessels based in Santa Barbara. Finally, it bears emphasis that the Department included Alternatives 1 and 3 in the range of alternatives considered in the Draft ED, in part, in response to a number of comments received during the MRWG and Fish and Game Commission processes. See also Response to Comment 5 regarding socioeconomic impacts.

Comment 187: The document should address potential negative impacts of displaced consumptive activities. How does the Department propose to follow the Science Advisory Panel recommendation that effort should not increase in the remaining open areas?

Response 187: The potential impacts of displaced consumptive activities are discussed in the Draft ED on page 5-31, in an expanded discussion on pages 5-33 through 5-35 in the Final ED, and in Response 47. Controls on total effort in fisheries are addressed in the Fisheries Management Plan process. For the nearshore fishery, this includes a level of precaution that is consistent with the amount of area suggested for MPAs in the proposed project. The proposed project, as a result, taken together with the Fisheries Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5.

Comment 188: The document does not discuss fish behavior and mobility in relation to residence time within a marine reserve and how this will affect the benefits of marine reserves on different species.

Response 188: The Department agrees that the specific behavior of various species is not discussed. In many cases, dispersal and home range distances are unknown and thus cannot be included. This situation exemplifies the scientific uncertainty that is inherent in the development of MPAs and is recognized in the principle of adaptive management. The design of MPAs in the proposed project is based on a variety of criteria intended to promote benefits to many species. One of the important ecological criteria used in the design of the proposed project is connectivity between MPAs through the movement and dispersal of species. This is described on page 5-15 of the Draft ED. Given the wide range of potential dispersal distances, MPA networks with a variety of reserve sizes, habitat types, and spacing are necessary to protect species of interest in the project area.

Comment 189: The document should list or rank local species that may or may not receive benefits from marine reserves. Local fish behavior and movement patterns should be cited and a ranking of benefits from spillover developed.

Response 189: The Department disagrees. Because life history parameters such as movement patterns and larval dispersal are not known for many species, this type of ranking would not be feasible. The Department has produced a document detailing the relative benefits of MPAs for a variety of species and species groups. This document has been added to the Final ED as Appendix 6.

Comment 190: How did the Department determine levels of significance for economic impacts in developing the proposed project?

Response 190: The threshold of significance for economic impacts was taken directly from CEQA and is described on page 5-43 of the Draft ED.

Comment 191: The Draft ED should note the potential area closures under the Endangered Species Act for threatened bird populations. All areas that may be considered for closure should be identified to address potential cumulative impacts.

Response 191: The Draft ED discusses the existing seasonal area closures to protect nesting and breeding brown pelican populations in Table 3-1 on page 3-2. The Department is recommending that this closure be maintained. Because these closures are not year round, they do not provide the same types of environmental benefits as an MPA. The specific purpose of seasonal closures, as noted in the comment, is to protect sea birds and is only a minor subset of the proposed project=s goals and objectives. On August 22, 2002, the Department, after reviewing a petition under the California Endangered Species Act (CESA) submitted by the Pacific Seabird Group, provided a written analysis to the Commission indicating that the petitioned action to list Xantus's murrelet (*Synthliboramphus hypoleucus*) as threatened under CESA may be warranted. The Commission, however, has yet to act on the Department's recommendation. In the event the Commission concludes that the petitioned action may be warranted and the Xantus's murrelet is designated a candidate species under CESA, take of any individual members of the species would be prohibited absent authorization by the Commission or Department. At this juncture, however, the Commission has yet to take any action with respect to Xantus's murrelet under CESA and there are no proposed closures under consideration by the Commission. See also Response to Comment 124.

Comment 192: No community or MRWG meetings were held in the Los Angeles region to allow adequate community input for this region.

Response 192: The Department disagrees that there was inadequate opportunities for community input from the Los Angeles area. See Responses to Comment 48 and Comment 183.

Comment 193: The Scorpion Anchorage site, coupled with Painted Cave, will lead to excessive displacement of squid and lobster fishing.

Response 193: The maximum potential loss estimated for these areas represents approximately 1.4% of the total annual squid value and 1.4% of the total annual lobster value generated in the project area (Leeworthy and Wiley 2002). The Department does not expect that this level of loss would lead to excessive displacement. The proposed project, in turn, taken together with the Fisheries Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5.

Comment 194: What is the Department's rationale and biological benefits for creating a recreational take only site at Painted Cave when specific congestion concerns were raised from the commercial sector.

Response 194: The overall estimated economic impact to commercial fishing from the Painted Cave State Marine Reserve is 0.3% of the revenue generated in the project area (Leeworthy and Wiley 2002). This, in combination with the small size of the proposed area (2.1 nm²) was included in the consideration of comments from the commercial sector. The working draft was revised to reduce the size of this proposed site based on those same comments. The Department believes significant congestion of commercial fishing will not occur at the site. The Department's rationale for including the site is found on page 5-25 of the Draft ED. This rationale includes not only biological benefits to species inhabiting the steep rocky walls both above and below the surface, but the ecological value of a relatively undisturbed natural feature. In addition, the Department does not expect any significant environmental impacts with implementation of the proposed project. See also Response to Comment 5.

Comment 195: Concerns were raised regarding displacement and impacts to prawn trap fishing and pelagic fishing at Gull Island as well as enforcement issues with the northwest boundary.

Response 195: The maximum potential loss in annual revenue from the spot prawn fishery estimated for the Gull Island reserve is approximately 2% and for pelagic fisheries (shark, wetfish, and tuna) ranges between 0.5% and 2.5% (Leeworthy and Wiley 2002). The Department does not expect that this site would lead to significant displacement of spot prawn or pelagic fishermen. The northwest boundary runs due west from Morse Point, a known landmark, along a whole minute line of longitude. Given electronic navigation capabilities, the Department expects that this boundary will be enforceable. The proposed project, as a result, taken together with the Fisheries

Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5.

Comment 196: Concerns were raised regarding gill net fisheries outside one nautical mile in the Carrington Point site. The halibut and white sea bass fisheries analysis should be gear, rather than species specific.

Response 196: The working draft of the proposed project was altered based on this comment by moving the offshore boundary 0.5 nm south towards shore. The economic analysis was performed on species groups in an attempt to reflect the multi-species nature of many of the fisheries. Because social and economic effects are not environmental effects subject to analysis under CEQA, the Department believes the economic information provided in the Draft ED provides sufficient information to foster informed public decisionmaking on these issues. See also Responses to Comment 5 regarding socioeconomic impacts and Comment 12.

Comment 197: The Skunk Point site coupled with Carrington Point and Harris point will lead to excessive displacement and congestion of the crab and halibut fisheries.

Response 197: The Skunk Point site had no economic impact to the crab or halibut fisheries in the economic analysis (Leeworthy and Wiley 2002). The other two sites do show a relatively high maximum potential economic impact compared to other individual sites. Even so, the total maximum potential economic impact from these two sites is estimated at around 10% for both crab and flatfish commercial fishing (Leeworthy and Wiley 2002). Given that the cumulative potential economic impact to crab and flatfish fishing for the entire proposed project is less than 15% (Leeworthy and Wiley 2002), the Department does not expect, for this and other reasons, that the MPAs would lead to significant displacement or congestion. The proposed project, as a result, taken together with the Fisheries Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5.

Comment 198: How does the Department propose to deal with displaced effort from the crab fishery?

Response 198: In 2001, 35 vessels landed rock crab caught in the project area (Fish and Game Landings data). The maximum potential loss in ex-vessel revenue was estimated at less than 15% for this fishery (Leeworthy and Wiley 2002). The Department does not expect that this potential loss will lead to a significant displacement of effort from the fishery. The proposed project, as a result, taken together with the Fisheries Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Responses to Comments 5 and 72.

Comment 199: What is the Department's rationale for including more than 90% of the north facing habitat of San Miguel Island?

Response 199: The proposed project does not include more than 90% of the north facing habitat of San Miguel Island. Only approximately 50% of the North facing coastline is included in the Harris Point, San Miguel Island, proposed reserve. The Department included this area in the proposed project for its high habitat diversity (Figure 8-1) and the multiple species of interest that reside in the area. The Draft ED describes this in detail on pages 5-28 through 5-29.

Comment 200: The proposed project moves the western boundary of the South Point SMR one mile west from where it was originally drawn in the public process. What is the Department's rationale for moving the western boundary at South Point, Santa Rosa Island?

Response 200: The MRWG process did not result in any consensus on specific boundaries and many alternatives for this site were examined during the public process. The boundary used in the proposed project is the same as that used in the working draft presented to the MRWG members. The biggest concern identified by the commercial representatives was economic impacts to prawn fisheries on the southern edge of this MPA. The working draft was altered, moving the boundary north, in response to this comment. Among other reasons discussed in the Draft ED, the Department chose the western boundary to include additional kelp habitat, and to use both a whole minute of Longitude and a well defined point of land to ease enforcement.

Comment 201: What is the rationale for including two alternatives (1 and 3) that have the majority of reserve habitat representation in the Oregonian and Transition province and have a disproportionate impact to Santa Barbara Harbor?

Response 201: See Response to Comment 186.

Comment 202: Why does the document include alternatives that have boundaries that are confusing and difficult to enforce?

Response 202: This comment appears to focus on a particular statement in the Draft ED regarding Alternatives 1, 2 and 4. The statement notes, to the extent the Commission adopts any of these alternatives, that the associated boundaries are "confusing and difficult to enforce[.]" thereby decreasing the effectiveness of these alternatives from a fishery management perspective. (Pages E-2 and E-3). Despite their shortcomings, the Draft ED includes these alternatives in Response to Commission regulations and provisions in CEQA requiring analysis of a reasonable range of project alternatives. The Department also deemed it important to include these alternatives because their specific boundaries were developed either during the MRWG public process or, in the case of Alternative 2, proposed by a set of commercial fishermen. Inclusion of these alternatives for analysis in the Draft ED is important because of the extensive public involvement in the proposed project to date, as well as the Department's desire to adequately reflect the specifics discussed during that process. The Department interprets the statement in the Draft ED to mean that the proposed boundaries for these alternatives would reduce the effectiveness of the MPAs. In the Department's view, this finding is yet another reason why the proposed project more adequately meets the project objectives. Please see Responses 184 and 185 for additional information.

Comment 203: How did the Department determine it's preference to establish a network with lower economic impacts than Alternatives 4 and 5.

Response 203: As described on page 1-4 of the Draft ED, the proposed project attempts to address the MRWG=s consensus goals including the socioeconomic goal to maintain long-term socioeconomic viability while minimizing short-term socioeconomic losses to all users and dependent parties.@ While the proposed project represents the most habitats at a level of 20% or higher, it results in lower economic impacts than both Alternatives 4 and 5. As seen in Table 6-58 on page 6-69, the proposed project has a higher habitat representation per dollar of impact than Alternatives 2, 4, or 5. This demonstrates the proposed project=s potential to meet long term needs by representing appropriate levels of habitat, while minimizing short-term economic losses. See also Response to Comment 5 regarding socioeconomic impacts.

Comment 204: The document fails to recognize the phasing sub options of Alternative 2 as well as the recommendation to include Santa Barbara Island in the MLPA process.

Response 204: See Response to Comment 147.

Comment 205: The document and proposed project do not include any additional monitoring plans that will contribute to future decisions. How do the lead agencies

propose to gather economic and biological data for use in future decisions such as the MLPA?

Response 205: See Response to Comment 110.

Comment 206: How does the Department propose to address fleet reduction for fisheries that are fully exploited, overcapitalized, displacement and congestion from the establishment of MPAs?

Response 206: Regulation of overall fleet size, capacity, and allowable take is addressed through the Fishery Management Plan (FMP) process. The Commission recently expressed its intent to accept the Department's recommendation regarding the Nearshore FMP, which addresses many of the finfish fisheries in the project area, and final approval of the Nearshore FMP is expected in October 2002. The Nearshore FMP will reduce capacity, limit entry into, and set a total allowable catch for the nearshore fishery. The Squid fishery management recommendations make similar adjustments. Other high priority FMPs include the sea urchin fishery. The Commission can also implement restricted access for a fishery prior to the development of a full FMP (e.g., spot prawn trap fishery). See also Responses to Comments 4 and 5.

Comment 207: Short term harvest reductions on top of area closures without proper overall fleet reduction combined with the proposed project will lead to excessive congestion, over fishing and unsustainable fisheries. The document does not adequately discuss the potential impacts of congestion of effort, or cite any local or regional studies of marine reserves for spillover benefits that offset congestion.

Response 207: See Response to Comment 5.

Comment 208: The proposed project relates specifically to State waters and is a State proposal. The action does not fall under the Federal mandates of the Regulatory Flexibility Act, Regulatory Impact Review, or NEPA. The subsequent Federal phase will be addressed by the Federal government in a separate process. This subsequent phase will be subject to all applicable federal laws, including relevant Federal regulations, the Regulatory Flexibility Act, Regulatory Impact Review, and NEPA.

Response 208: The proposed project relates specifically to State waters and is a State proposal. The action does not fall under the Federal mandates of the Regulatory Flexibility Act, Regulatory Impact Review, or NEPA. The subsequent Federal phase would be addressed in a separate process. This subsequent phase would be required to meet the requirements of Federal regulations including the Regulatory Flexibility Act, Regulatory Impact Review, and NEPA.

Comment 209: The statement that "little is known about the distribution of hard sediments on the deep continental shelf and slope in the Sanctuary" is not made in the Habitat Representation section for the proposed project.

Response 209: The comment seems to confuse the State waters portion of the analysis with the cumulative State and Federal waters analysis. Because these habitats are not found within State waters, the Draft ED notes their absence from the representation. With regards to the proposed project, Page 5-19 states "[d]eeper habitats are poorly represented in all regions due to their absence in State Waters." With regards to the cumulative representation in State and Federal waters, Page 5-33 states, "[l]ittle is known about the distribution of hard sediments on the deep continental shelf and slope in the Oregonian and Californian Bioregions." Because the discussion of cumulative impacts is combined in a single section for each of the other alternatives, this statement is made in the same paragraph as that for State waters.

Comment 210: It should be noted that fisheries dependent on kelp availability may experience additional congestion from additional loss of fishing grounds due to limited kelp abundance during El Niño or other events.

Response 210: In order to meet the scientific design criteria and goals, reserves must be replicated so that at least some reserves will maintain kelp habitat even when natural abundances are low. Replicates must contain kelp habitat to ensure this occurs. The Fishery Management Plan process under MLMA would include provisions for changes in allowable catch when abundance or available resources drop. Thus, if a naturally occurring fluctuation led to lower resource availability, the fishery's allowable catch would be reduced to maintain appropriate stock biomass. The proposed project, as a result, taken together with the Fisheries Management Process, is not expected to result in significant, adverse environmental impacts. Moreover, the adaptive management component of the proposed project, as required by the Marine Life Protection Act, which includes ongoing monitoring, research and evaluation after project approval, will provide ongoing information regarding post-approval environmental conditions. This information, along with the Department's authority to recommend additional management measures to the Commission, will ensure that approval of the proposed project does not result in any significant environmental impacts. See also Response to Comment 5 regarding adaptive management.

Comment 211: The proposed project is the minimum protection necessary.

Response 211: The Department disagrees. The proposed project represents and replicates a wide range of habitats within the project area (see Draft ED Chapter 5). Each alternative represents varying amounts of habitat, including higher and lower levels of representation. However, the proposed project includes not only the MLPA goal to represent habitat, but also the other goals of the act, which are not ranked in the MLPA and are seen as an overall framework for the State's MPAs. These include: to protect natural diversity and abundance, to help sustain conserve and protect marine life, to improve recreational, educational and study opportunities in areas subject to minimal human disturbance, and to protect marine natural heritage, including representative habitats. See also Response to Comment 10.

Comment 212: Expresses support for Alternative 5.

Response 212: See Response 10.

Comment 213: The proposed project does not fulfill the biodiversity goal and other key MLPA mandates to balance long-term interests with short-term impacts.

Response 213: The Department disagrees. The proposed project encompasses a wide range of habitats within the project area (see Draft ED Chapter 5). Each alternative represents varying amounts of habitat, including higher and lower levels of representation. However, the proposed project includes not only the MLPA goal to represent habitat, but also the other goals of the act, which are not ranked in the MLPA and are seen as an overall framework for the State's MPAs. These include: to protect natural diversity and abundance, to help sustain conserve and protect marine life, to improve recreational, educational and study opportunities in areas subject to minimal human disturbance, and to protect marine natural heritage, including representative habitats. See also Response to Comment 10.

Comment 214: The proposed project does not meet MRWG Ecosystem Biodiversity Goal.

Response 214: See Response 10.

Comment 216: Biogeographical representation as it pertains to the amount of kelp forest and rocky habitat is under represented. In particular, there is inadequate representation of kelp forest habitats in both the proposed project (21%) and Alternative 5 (24%), this habitat should be represented at closer to 30-50%.

Response 216: See Response 78. Additionally, rocky habitats in the nearshore environment are represented at between 20 and 30% in the proposed project. The Department believes that this level of representation, along with other management measures, is sufficient to meet ecological objectives.

Comment 217: It is unclear what is meant by the last two comments in section 2.7, Areas of Concern, regarding environmental allocation and conflicts among user groups.

Response 217: The community raised both of these concerns during the MRWG process. In both instances, the concerns are more appropriately addressed through the FMP process than through the placing of, or need for, the MPAs contemplated by the proposed project because both issues concern allocation of resources between groups. The MPAs contemplated by the proposed project, in contrast, address environmental and fisheries concerns, and not resource allocation among user groups.

Comment 218: The Fish and Wildlife Service is the agency that is responsible for the implementation of ESA as it pertains to sea otters.

Response 218: Comment noted. A clarifying statement to this effect has been added to page 4-132.

Comment 219: The southern sea otter is listed as "threatened" not "endangered" under the Federal ESA.

Response 219: Comment noted. The text on page 4-132 has been corrected.

Comment 220: Feeding of marine wildlife for the purposes of viewing, and other forms of wildlife harassment, needs to be better addressed in developing management plans for Marine Protected Areas within the Channel Islands National Marine Sanctuary. Feeding and other such forms of harassment result in deleterious effects on sharks and other fishes.

Response 220: Existing ecological reserve regulations prohibit the feeding of wildlife (Title 14, California Code of Regulations, Section 630 (12)). The proposed project would add Section 632 to Title 14, specific to Marine Protected Areas. This section would prohibit the feeding of wildlife within Marine Protected Areas (Proposed Section 632 (6)). The proposed regulation can be found on page A2-17 of the draft document. In the Department's view, existing regulations and the proposed regulation will avoid or reduce to below a level of significance the prospect of project-related adverse impacts on sharks and other fishes.

Comment 221: The proposal should require the use of specific electronic equipment when fishing in the region. This would make enforcement of and navigation around boundaries simpler and boundary violations easier to prosecute.

Response 221: Department of Fish and Game enforcement staff will develop an enforcement plan for Marine Protected Areas. If this plan requires the use of specific electronic equipment, regulations will be developed to implement the change. See also Response to Comment 17.

8.3 Copy of Comments Received

The closing date for comments on the Draft ED was September 1, 2002 at 5:00 p.m. Because this date fell on a Sunday and the following Monday was a State holiday, comments were accepted until September 3, 2002 at 5:00 p.m. Following are copies of all written comments received during the Draft ED comment period.

NOTE: Reproductions of the comments received are not included in this electronic copy of the Final ED.

Table 8-2. Names and locations of people who transmitted a form email from the Environmental Defense Action Network web site (Comment E-03-01).

Name	City	State/Country	Name	City	State/Country
Erik & Lori Booth	Ironwood	Michigan	Gregory Apo	Los Angeles	California
Aaron & Anna Morris	Coconut Grove	Florida	Tanya Aponte	Henderson	Nevada
Bill & Marilyn Voorhies	West Tremont	Maine	Erin App	Dallas	Texas
James & Samantha Mayo	Little Rock	Arkansas	Natalie Aragno	Chicago	Illinois
Kathryn & Paul Sanko	Tunkhannock	Pennsylvania	Isabel Araujo	Mexico, D.F.	Mexico
Barbara & Charles Mistele	Lake Bluff	Illinois	Vanessa Araujo	Cardiff	California
Lisa & Dylan Stieler	Santa Ana	Connecticut	Sandra Archer	Deltona	Florida
Hank & Carol Moore	Hibbing	Minnesota	Domenic Ariaudo	Staten Island	New York
Janice & Greg Dlugosz	Beachwood	New Jersey	Christie Arlotta	Natick	Massachusetts
Ken & Dawn Mettler	Rockbridge	Ohio	Nancy Armer	Reading	Pennsylvania
Richard & Mary Chaisson	Oxford	Connecticut	Lynn Armstrong	NY	New York
Martha & Edward Leahy	Winchester	Massachusetts	Corinne Armstrong	Pasadena	California
Paul & Kathryn Sanko	Tunkhannock	Pennsylvania	Kimberly Armstrong	Chicago	Illinois
L. A. Pam Thornton	Tularosa	New Mexico	Melissa Armstrong	Davie	Florida
D. A. Wall	Brandon	South Dakota	Rebecca Arnhold	Charlotte	North Carolina
Albert A. Gaydos	Woodhaven	New York	Jillian Aronson	Orlando	Florida
James A. Pierson	Charleston	South Carolina	Ardith Arrington	Seattle	Washington
David A. Jones	Mexico Beach	Florida	carol artz	hagerstown	Maryland
Maureen A. Flannery	Berea	Kentucky	David Asselin	Greene	Maine
William Aaron III	Dallas	Texas	Neil Asselin	Macomb	Michigan
Stephanie Abbott	Denton	Texas	Kimberly Atkin	Brockton	Massachusetts
Zaarah Abdul-Zahir	Cleveland	Ohio	Julie Atwell	Northport	Alabama
Barry Abrams	New York	New York	Jeff Auch	Montague	Michigan
Skye Abt	Lafayette	Indiana	Michele Augustine	Madison	Wisconsin
Kris Acevedo	Revere	Massachusetts	Peter Auster	Chester	Connecticut
Mina Acevedo	Morton Grove	Illinois			
Wendy Ackerley	St. Pauls	North Carolina			
Adrienne Acoba	Santa Maria	California	Alexandra Avenius	Madison Heights	Michigan
Mike Acton	Hudsonville	Michigan	Anthony Averett	San Diego	California
Sara Adams	Leeds	United Kingdom	Catherine Avery	Front Royal	Virginia
Alice Adams	murphysboro	Illinois	Janet Ayres	Houston	Texas
Barb Adams	San Antonio	Texas	Helen B. Grumman	Newton	Massachusetts
Jennifer Adler	Kenmore	Washington	George B. and Molly Hutchinson	Medford	Oregon
Felix Aguilar, MD	Long Beach	California	Jason B. Ball	Austin	Texas
Sanjay Ahluwalia	Covina	California	katherine babiak	new york	New York
Zered Ahmad	Amsterdam	Netherlands	Andres Baca	Miami	Florida
Laurie Alaïmo	Campbell	California	Michael Badalamenti	San Luis Obispo	California
J. Alan Pollard	Richardson	Texas	Edward Bade	Berkeley	California
David Alana	Sebastopol	California	Alison Baden	Dallas	Texas
Annette Albert	Revere	Massachusetts	Brenda Badiuzzi	Marietta	Georgia
Evan Albright	San Luis Obispo	California	Frank Baele	Santa Monica	California
Lori Albright	Connellsville	Pennsylvania	Jacquelyn Baetz	Albany	New York
Lori Albright	Connellsville	Pennsylvania	Joanna Bagatta	Mahopac	New York
Marsha Alexander	CARMEL	Indiana	Linda Bagneschi	Novato	California
Thomas Alexander	Quincy	California	Donna Bahr-Landsea	Miami	Florida
Alexis Alicea	Patrick AFB	Florida	Sean Bailey	Seattle	Washington
Michelle Aljundi	Hudson	Florida	Pamela Baker	East Lansing	Michigan
Dr. Allan Olson	Marquette	Michigan	Connie Baker	Winters	California
Aneda Allen	Mesa	Arizona	Rhonda Baker	Akron	Ohio
Janet Allen	Syracuse	New York	Sharon Baker	Petersburg	Tennessee
Angela Allen	Belton	Texas	Wesley Baker	Kingsport	Tennessee
Thomas Allgaier	Palm Bay	Florida	Ethel Bakke	Lake Orion	Michigan
Eric Althoff	Altadena	California	Paula Bakker	Rotterdam	Netherlands
Dr. Amanda Landis-Hanna	Auburn	Alabama	Tom Baldwin	Ashland	Oregon
Arthur Ambrozewski	South Bend	Indiana	Debra Ballou	Orono	Maine
Frank and Phyllis Bottomley	Hornell	New York	Gypsy Bandita	Montgomery	Texas
Gene and Doris Peters	Mitchel	South Dakota	Nathalie Banger	Kingston	Canada
John and Lucy Perko	Ojai	California	Lucy Bannister	Boerne	Texas
John and Mary Harte	Berkeley	California	Kelly Baraka	Mill Valley	California
Eric and Sharon Siggins	Piscataway	New Jersey	Clelia Barbadoro	Rome	Italy
Wayne and Barbara Covey	Media	Pennsylvania	Diana Barbee	Calabasas	California
Tom and Barbara Hamilton	Oceanside	California	Jeanne Barber	San Jose	California
Rollin and Lynne Young	Napa	California	Marilyn Barefoot	W. Lafayette	Indiana
Susan and Jim Gear	Medford	Oregon	Rachel Barge	San Clemente	California
Ray and Lorraine Crowley	Georgetown	Texas	Lauren Barlow	Columbia	Missouri
Linda and Bill Lane	Montpelier	Virginia	Deb Barmichael	Phoenix	Arizona
Eileen Anderson	Columbus	Ohio	Rebecca Barnes	Lincolnton	North Carolina
David Anderson	Athens	Georgia	Jaime Barnes	Dunkirk	New York
Jane Anderson	Mebane	North Carolina	Brenda Barnes	Hickory	North Carolina
John Anderson	Maple Valley	Washington	Kathryn Barnes	Sherwood	Michigan
Constance Anderson	Sevierville	Tennessee	Daniel Barnett	Bronx	New York
Don Anderson	Corvallis	Oregon	Carina Barnett-Loro	Durham	North Carolina
Kelly Anderton	Denver	Colorado	Gordon Barrett	Saratoga	California
Gian Andrea Morresi	Fairfield	Connecticut	Lori Barrow	Virginia Beach	Virginia
Gabriel Andres Thoumi	Minneapolis	Minnesota	Karen Barrows	Nordland	Washington
Philip Andrews	Fairfax	California	Michael Barrows	Pacifica	California
M. Anga Rebane	Las Vegas	Nevada	Trisha Barry	Tamarac	Florida
Mary Ann Hilgeman	St Louis	Missouri	Edward Bartel	Anaheim	California
Jo Anne Smith	Christiansburg	Virginia	John Barthel	Owatonna	Minnesota
Mary Anne Barbic	S. Euclid	Ohio	William Bartleman	El Cajon	California
Lisa Anne Zilney	Knoxville	Tennessee	Darryle Bates	Cuyahoga Falls	Ohio
Nika Annon	Cochiti Lake	New Mexico	John Bates	San Francisco	California
Susana Anschutz	Miami	Florida	Virginia Batson	Philadelphia	Pennsylvania
Anthony Antich	New York	New York	Lynn Bauer	Fairfax	California
Liisa Antilla	Lacey	Washington	Saskia Baur	Scotts Valley	California
Ana Antunes	Sintra	Portugal	Rita Bawden	Plano	Texas
			Nigel Baxter	London	United Kingdom

Name	City	State/Country
Daniel Bayona	Bogota	Colombia
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Marc Beauchamp	Napa	California
Renee Becht	Haleiwa	Hawaii
Carter Beckett	Santa Fe	New Mexico
Thea Beckett	Santa Fe	New Mexico
Azel Beckner	Bowling Green	Kentucky
Dan Behrens	Doylestown	Pennsylvania
Stephen Beliaeff	Fresno	California
ann bell	augusta	Georgia
Robert Bell, III	Chapel Hill	North Carolina
Peggy Beltrami	Houston	Texas
Shari Bence	Cambridge	Massachusetts
Jill Bender	New Hamburg	
Betty Bender	Palmdale	California
Donna Benjamin	Santa Fe	New Mexico
Sonya Bennett	Harrisburg	Pennsylvania
Darleen Benson	Asheville	North Carolina
Don Bentley	Phoenix	Arizona
Cheryl Berg	pahoa	Hawaii
Georges Berges	San Diego	California
Carol Bernacchi	LA	California
William Berry	Tampa	Florida
Ellen Berryman	Auburn	California
Shawn Bert	La Mirada	California
Harrison Bertram	SCHAUMBURG	Illinois
Michael Besem	Los Angeles	California
Michael Besem	Los Angeles	California
David Beskind	W. Simsbury	Connecticut
Stacey Betts	Center Cross	Virginia
Andrew Bezella	Chicago	Illinois
Russell Bezette	LaVerkin	Utah
Animesh Bhattacharya	Kent	Ohio
Macarena Bianchi	Los Angeles	California
John Biddulph	Hamilton	New Jersey
Rita Bieszk	Lombard	Illinois
Jessica Bigby	Richardson	Texas
michael bilecki	Brookhaven	New York
Jennifer Bilotta	Wyndmoor	Pennsylvania
Jennifer Birch	Bellevue	Washington
Wendy Biser	Littleton	Colorado
Jeremy Bishko	Cleveland Heights	Ohio
Emily Bishop	Goleta	California
Auri Biswas	Fremont	California
Aurion Biswas	Fremont	California
Montana Black	Boulder City	Nevada
John Blackiston	Winter Haven	Florida
Robert Blackiston	Sewell	New Jersey
Melinda Blake	Playa del Rey	California
Charles Blakeslee	Tucson	Arizona
Sharon Blank	Santa Monica	California
Kristie Blase	Silver Spring	Maryland
Blaine Blinston	Edmonton	Canada
Catarina Blitz	Nashville	Tennessee
Steve Bloodworth	Fort Worth	Texas
Justin Bloom	Bronx	New York
Cynthia Bloomquist	Harvard	Massachusetts
Rebecca Blue	San Diego	California
Bruce Blum	Columbia	Maryland
Audrey Blumeneau	Santa Cruz	California
Leo Blyler	Las Vegas	Nevada
Nicole Blythe	Stuart	Florida
Linda Boag	Long Beach	California
Kathryn Bodnarchuk		Great Britain
Thomas Boesch	Cuyahoga Falls	Ohio
Rachel Boexk	Borden	Canada
Ryan Boggan	Sterett	Alabama
Holly Bognar	Richmond	Virginia
Lori Bohannon	Simi Valley	California
Connie Boitano	Seattle	Washington
Julie Bolcer	South Orange	New Jersey
Julie Bond	Edgerton	Wisconsin
Marliese Bonk	Pittsburgh	Pennsylvania
Victoria Bonsignore	Miami	Florida
James BonTempo	Chicago	Illinois
Ivy Borden	Williamsville	New York
Liz Borman	Berkeley	California
Pamela Borres	Pinellas Park	Florida
Fran Bosche	Bailey	Colorado
Mathilde Boton	Athens	Greece
Alexandre Bottos	Mirassol/SP	Brazil
Julie Bourns	Washington	District of Columbia
Benita Bowen	Bellingham	Washington
Karin Boyce	Roseville	Minnesota
Timothy Boyd	Myrtle Beach	South Carolina
Kenneth Bozek	South Hadley	Massachusetts
Beverly Bradley	Marietta	Ohio
Lorraine Brady	Austin	Texas

Name	City	State/Country
Chris Branam	Fayetteville	Arkansas
Glen Brandenburg	Vista	California
Ken Brandis	Tucson	Arizona
Rick Brandon	Tehachapi	California
Molly Brann	Houston	Texas
Michelle Bratt	Ashton	Idaho
Randy Braun	South Hadley	Massachusetts
Pam Brawn	Jefferson	Maine
Louise Bray	Culver City	California
Aidan Brendan	Viroqua	Wisconsin
Cori Brendle	Largo	Florida
Nancy Brennan	Casper	Wyoming
Thomas Bressani	Deltona	Florida
Deanna Brewster	Essex Jct	Vermont
Shannon Briare	Elma	Washington
Sara Briddell	Adel	Iowa
Susan Bridges	Highland	Indiana
Doug Bridwell	Olathe	Kansas
Ian Briggs	Santa Cruz	California
Jim Brillion	Anaheim	California
Khadijah Britton	Cambridge	Massachusetts
Erica Brodman	Reading	Pennsylvania
Laurie Bronson	Montverde	Florida
Dan Brook	SF	California
Eliet Brookes	Milwaukee	Wisconsin
James Brooks	Fort Lauderdale	Florida
Kelsey Brooks	Athens	Georgia
Rebecca Brooks	Louisville	Kentucky
Michelle Brooks	Los Angeles	California
Bonnie Bross	Kansas City	Missouri
Deb Brower	Humptulips	Washington
Deidre Brown	Croton Falls	New York
Phil Brown	Chattahoochee	Florida
Jim Brown	Los Angeles	California
Beth Brown	Limington	Maine
Samantha Brown	Palos Verdes Estates	California
Warren Brown	Oak Harbor	Washington
Tristan Brown	Franklin	Michigan
Kacey Browne	Los Angeles	California
Susan Browne	Atlanta	Georgia
Sid Browne	Chico	California
Thomas Browne	Green Bay	Wisconsin
Diana Brownell	Somerset	New Jersey
Destiny Browning	Davenport	Iowa
Chelsea Browning	Port Orchard	Washington
Natasja Brozius	Wilnis	Netherlands
Abigail Bruce	Oakland	California
Timothy Bruck	Mentor	Ohio
Dianne Brueckner	Carlsbad	California
Rita Bruner	Mickleton	New Jersey
Jeannie Brunnick	Manhattan Beach	California
Ricard Bruno	boulogne billancourt	France
Kathy Bruns	Ventura	California
Elizabeth Bryan	Leavenworth	Kansas
Pamela Bryson	Houston	Texas
Lara Bubeck	Waterbury	Connecticut
Dwight Buck	Mammoth Lakes	California
Anne Buffard	Seattle	Washington
Vera Buk-Bjerre	Kent	Ohio
Gena Bukur	Kissimmee	Florida
Melissa Bulkowski	Byron Center	Michigan
N Bullock	New York	New York
Barbara Bullock-Wilson	Carmel	California
Terry Bunch	San Diego	California
Brea Burgie	Greeley	Colorado
Janet Burgoon	Malvern	Pennsylvania
Beverly Burk	New York	New York
Patricia Burke	Westchester	Illinois
Molly Burke	Wilkes-Barre	Pennsylvania
Pauline Burkhart	Jacksonville	Florida
Jennifer Burks	Louisville	Kentucky
Deborah Burnett	Brooklyn	New York
Jodi Burns	Arvada	Colorado
Kelly Burrington	Altamonte Springs	Florida
Solace Burris	Washougal	Washington
Stephen Burrows	Birmingham	Michigan
Name	City	State/Country
Rachael Bush	Ogden	Utah
Martha Bushnell	Boulder	Colorado
Bruce Bushong	Muskogee	Oklahoma
Bill Buss	Corrales	New Mexico
Brenda Bussell	Mastic Beach	New York
Lisa Butch	Meadville	Pennsylvania
Larry Butcher	Sacramento	California
David Butlein	Mountain View	California
Brenda Butler	Bath	Illinois
Gwendolyn Butler	Malden	Massachusetts
Darrol Butler	Redding	California

Name	City	State/Country
Doug Butler	Painted Post	New York
Sarah Butler	Orinda	California
Thomas Butler	San Francisco	California
Debra Butterworth	San Antonio	Texas
Charles Byrne	Chicago	Illinois
Patricia Byrnes	Mill Valley	California
Jason Byrnes	Mishawaka	Indiana
Allison Byrum	Wimberley	Texas
Beverly Byrum	Rotonda West	Florida
Peter C. Reilly Flannery	Berea	Kentucky
Lori C.	Virginia Beach	Virginia
Raquel Cabrera	Miami	Florida
Gregory Cadieux	Burlington	Vermont
Tania Caillouet	San Diego	California
Nancy Cain	Leadville	Colorado
Karen Cairns	Blacksburg	Virginia
Antonio Calabria	San Antonio	Texas
Marianne Calame-Berger	Albany	California
Leann Calhoun	Columbus	Ohio
Krys Call	Santa Cruz	California
Evelyn Callahan	Brunswick	Georgia
Jill Callahan	Round Lake Beach	Illinois
Annie Calpe	orlando	Florida
Julie Calvert	San Diego	California
Dave Cambrai	Centereach	New York
Jeff Cameron-Martin	Pasadena	California
William Camp	Byhalia	Mississippi
Kathleen Campbell	Berwick	Maine
Victoria Campbell	Orange	California
Lisa Canape	Salt Lake City	Utah
Tiffany Candelaria	Phoenix	Arizona
David Cann	Oakland	California
Crista Cannariato	Santa Cruz	California
Jamie Cannon	Eugene	Oregon
Misty Cao	Arlington	Texas
Paula Capece	Flourtown	Pennsylvania
Rosemary Cardello-Letch	Newburyport	Massachusetts
Catherine Cardelus	Gainesville	Florida
Stephen Carey	Drexel Hill	Pennsylvania
Joel Carico	Orange	California
David Carico	San Luis Obispo	California
Elan Carlson	Phoenix	Arizona
Mitch Carpen	Plainfield	New Jersey
Victor Carpino	Fort Collins	Colorado
Adrianne Carr	Stanford	California
Bryanna Carroll	Chicago	Illinois
Dru Carter	Plainwell	Michigan
Amanda Carter	Brooklyn	New York
Marian Carter	West Covina	California
Jessica Caskey	San Jose	California
Donna Cassidy-Hanley	Freeville	New York
Rachel Castor	Corvallis	Oregon
Ana Castro	Norwalk	California
Robert Cataldo	San Juan Capistrano	California
Rain Cater	Atlanta	Georgia
David Cayford	santa rosa	California
JoAnn Celaschi	Charleroi	Pennsylvania
Deanna Cerrone	Quechee	Vermont
Julio Cesar Torres	Santa Cruz	Venezuela
Bill Chadwick	Markham, Ontario	Canada
Charlana Chaffee	San Diego	California
Rhonda Chaikin	Lafayette	California
Joy Chambers	Milford	Massachusetts
Elaine Chang	Berkeley	California
Roger Chao	Blackburn	Australia
Mary Chapman	Ashland	Oregon
Betty Chapman	St. Louis	Missouri
Robert Chappell	Tucker	Georgia
Martha Chase	Johnson City	Tennessee
Adam Chase	OWINGS Mills	Maryland
Aaron Chase	Truckee	California
Kim Chase	New York	New York
Howard Chasin	Bakersfield	California
Catherine Chatfield	Salt Lake City	Utah
Margaret Chernela	South Orange	New Jersey
Lora Child	St. Paul	Minnesota
Anel Chima	Santa Cruz	California
Dorothy Chiu	Alpharetta	Georgia
Leah Choi	Chatsworth	California
Michele Chouret	Memphis	Tennessee
Janice Christensen	Dallas	Texas
Tracey Christensen-Burgess	Springfield	Missouri
Kevin Christensen-Burgess	Springfield	Missouri
Lynn Christie	Pittsburgh	Pennsylvania
Mizpah Christina Thomas	Woodland Park	Colorado
S Christoff	Santa Barbara	California
Sandrine Christophe	Woodside	New York
Searles Christopher	Brooklyn	New York
Michael Christy	Desert Hot Springs	California

Name	City	State/Country
Lisa Chun	Lihue	Hawaii
Denise Chun	San Diego	California
Amy Chuo	Flushing	New York
Theresa Ciaverella	Altoona	Pennsylvania
Kathleen Cipriano	Deltona	Florida
Charmaine Clapp	Rosemead	California
Henry Clarence	Berkeley	California
Alice Clark	Tooele	Utah
Cristina Clark	Parryville	Pennsylvania
Craig Clark	metuchen	New Jersey
Diana Clark	Sarasota	Florida
Fritz Clark	Lenexa	Kansas
Kit Clark	Santa Cruz	California
Kathleen Clayton	Cape Girardeau	Missouri
Edna Clegg	Paris	Texas
Regina Clewell	Davenport	Iowa
Mike Clipka	Lathrop	California
Loren Clive	Berkeley	California
Carrie Coakley	New York	New York
Patsy Coats	Birmingham	Alabama
Kathy Coffman	Schaumburg	Illinois
James Cogan	Novato	California
Nayana Cohen	Edgewood	New Mexico
Anne Cohen	Takoma Park	Maryland
Lawrence Cohen	Takoma Park	Maryland
Dana Cole	Tampa	Florida
Donna Cole	Elkmont	Alabama
Angela Coleman	mableton	Georgia
Jennifer Coleman	Hendersonville	Tennessee
Leslie Coles	Cincinnati	Ohio
Mark Collier	Boulder	Colorado
Elizabeth Collins	Birmingham	Alabama
Taeya Collins	Ft. Belvoir	Virginia
Rene Colucci	Hopewell Junction	New York
Patrick Colvin	Turlock	California
Sean Compost	San Diego	California
Chuck Comstock	Morrisville	North Carolina
Gabe Condie	Clayton	North Carolina
Lindsay Conlon	Big Bear Lake	California
Zigmund Connell	Webster	Massachusetts
karen Connelly	Fort Drum	New York
Vicki Connon	south bend	Indiana
Kristin Conover	Carlsbad	California
Michael Conroy	Portland	Oregon
Gabriel Constans	Santa Cruz	California
Rita Contreras Avery	San Antonio	Texas
Thomas Conway	methuen	Massachusetts
Marcia Conway	Hinesburg	Vermont
Erin Cook	Celina	Ohio
Joshua Cook	Austin	Texas
Stephanie Cooce	Redondo Beach	California
Kris Coontz	Santa Cruz	California
Lily Copenagle	New York	New York
Stephanie Cordeau	Quebec	Canada
Reo Cordes	Oceano	California
Shelley Cornett	Kerrville	Texas
Stephanie Corona	Downey	California
Terry Corris	Springfield	Oregon
Pamela Corwin	Olympia	Washington
Deidre Corwyn	Norcross	Georgia
Scott Cosby	Ontario	Canada
Bill Cosentino	Stratford	Connecticut
Francisco Costa	Cathedral City	California
Katherine Cote	Milford	Massachusetts
Glenn Cotten	Hartsdale	New York
Leah Couk	Hutto	Texas
Jesse Counterman	Sioux City	Iowa
Linda Cousland	Millis	Massachusetts
Kevin Covey	Seattle	Washington
Scott Cowan	Chicago	Illinois
Kellie Cowper	Mililani	Hawaii
Christi Cox	Durham	California
Mike Cozens	London	New York
Feather Craighead	Connorsville	Indiana
Shannon Cram	Arcata	California
Laurie Creighton	Buckeye	Arizona
Laurie Creighton	Buckeye	Arizona
Kellie Cremer	Pueblo	Colorado
Tammi Crider	gravois mills	Missouri
Shonna Crompton	Borup	Minnesota
Denise Cronin	Imperial	Missouri
Candace Cross	Riverside	California
Tonya Cross-Noblett	Caneyville	Kentucky
Nancy Crouse	Stewartsville	New Jersey
Michael Crowden	Kansas City	Missouri
Patricia Crowe	Methuen	Massachusetts
Lisa Crummett	Fullerton	California
Ana Cruz	Austin	Texas
Jianing Cui	Beijing	China

Name	City	State/Country
Lisa Cuizon	Thousand Oaks	California
Christina Cullen	Occidental	California
Vanessa Curbello	Briarwood	New York
Kristi Curtis	Watertown	New York
Tim Cuthbertson	Vernonia	Oregon
Susan Cutler	Vista	California
Maria Czyz	Valrico	Florida
John D Zabcik	Houston	Texas
Mary D. Kurtz	Athens	Georgia
Andrew D.S. Blair	Rochester	New York
Janet D'Annunzio-Ellis	Arlington	Massachusetts
Anthony D'Auria	Hanover	New Hampshire
Ed D'Urso	Piermont	New York
Debbie Daggett	Monroe City	Missouri
Sasa Daily	Phoenix	Arizona
Winfred Dale Merriman	Dunlap	Tennessee
Beth Dallam	Jersey City	New Jersey
Angela Dallara	Richmond Hil	New York
Robert DAmato	Morris	New York
Jason Daniel Cohen	Takoma Park	Maryland
Val Daniel	Houston	Texas
Valerie Daniel	Philadelphia	Pennsylvania
Patricia Daniels	Manassas	Virginia
Suzanne Danielson	Fredericksburg	Virginia
Grace Darcy	Carmel Valley	California
Elizabeth Darr	San Francisco	California
Maggie Dart-Padover	San Francisco	California
Inez David	Berlin	Germany
Jessica Davidson	Clackamas	Oregon
George Davis	Las Vegas	Nevada
Lee Davis	Clacton on Sea	United Kingdom
Marion Davis	Arlington	Virginia
Sean Davison	San Francisco	California
Steven Dawes	Omaha	Nebraska
Shirley Dawkins	Stanley	North Carolina
D.M. de Leeuw	Almere	Netherlands
Erin de los Cobos	Los Angeles	California
Jackie de Vries	Mahwah	New Jersey
Peter de Lijser	Orange	California

Name	City	State/Country
Ken De Stasio	Rutland	Vermont
Monique De Jesus	White Plains	New York
Willow Dea	Mountain View	California
Angi Dean	Beaumont	Texas
Rachel Dean	Santa Cruz	California
Carol DeAntoni	Crestone	Colorado
Patty Debenham	San Francisco	California
Bill DeBoer	Jenison	Michigan
Melissa DeCosta	Lake Panasoffkee	Florida
Chere DeForest	Portland	Oregon
Denise DeGeare	Omaha	Nebraska
Deanna DeLaney	Bedford	Indiana
Alejandra Delgado	Mexico City	Mexico
Leigh Delgado	Mayer	Arizona
Anthony DelGreco	New York	New York
John Dellaguardia	Coram	New York
Ann DeLollis	Fresno	California
Amanda DeLong	Vestavia Hills	Alabama
J DeMarco	Lockwood	New York
Christi DeMark	Hoboken	New Jersey
Claire Deneka	Concord	New Hampshire
John Dennis	Stacy	Minnesota
ALicia Denofrio	Suisun	California
Philip Dequine	Eagle Point	Oregon
Chad Derosier	Milford	New Hampshire
James Derzon	Falls Church	Virginia
Andy Dettling	farmington hills	Michigan
Deiter Dettling	Portland	Oregon
Lou Detwiler	Pahrump	Nevada
Lisa DeVaney	Portland	Oregon
Lisa DeVaney	Portland	Oregon
Lisa DeVaney	Portland	Oregon
Andrue Devine	Eglin AFB	Florida
Alan Dewey	Alfred Station	New York
Andrea Dewey	Miami	Florida
Diana Dexter	Overland Park	Kansas
Ann Di Donato	Rancho Cucamonga	California
Kathleen Dicarilo	Coconut Creek	Florida
Angie DiCesare	Nashua	New Hampshire
Shawn Dicken	Beaverton	Michigan
Mary Diebels	Plano	Texas
Steve Diebels	Plano	Texas
Ann Diego	Louisville	Kentucky
Kelly Dietrich	Dulles	Virgini
Kelli Dietz	Wauconda	Illinois
Travis Dietz	San Francisco	California
Gerard DiNome	Los Angeles	California
Lisa DiNunzio	Vineland	New Jersey
Valena Dismukes	Los Angeles	California

Name	City	State/Country
Jennifer Dixon	Albany	New York
Kirsty Dixon	Hobart	Australia
Elizabeth Dodd	Boca Raton	Florida
Sherri Doherty	KC	Missouri
Nancy Dollard	Valparaiso	Indiana
Jill Dominguez	Westminster	California
Sylvia, Don & Emily Leach	Wellesley	Massachusetts
Antonio Donateo	Serrano	Italy
Charlene Donath	West Hills	California
Marguerite Donnay	Miami	Florida
Anthony Donnici	Kansas City	Missouri
Thomas Donohue	Redondo Beach	California
John Donovan	El Cerrito	California
Abby Donovan	Eugene	Oregon
Heather Dooley	San Francisco	California
Bridget Doran	Ann Arbor	Michigan
Barbara Dorf	Aransas Pass	Texas
Lisa Downard	Canoga Park	California
Carolyn Doswell	Studio City	California
Deanna Doubleddee	Haymarket	Virginia
Felice Douglas	Forest Hills	New York
Chere Douglas	El Cerrito	California
Dianne Douglas	Phoenix	Arizona
Terri Douglass	Hamilton	Montana
Christine Doules	Philadelphia	Pennsylvania
Duane Dow	Granite Falls	Washington
Erin Dowling	Ann Arbor	Michigan
Charles Dowe	Boston	Massachusetts
Rachel Dowell	Bexley	Ohio
Simon Dowsey	Edmonton,AB	Canada
Sorin Dragan	Fairfax	Virginia
H Drake	Chapel Hill	North Carolina
Patricia Dray	Mission	Canada
Joel Dremlus	Reston	Virginia
Donald Dresser	Hockessin	Delaware
Donna Drew	Lancaster	Pennsylvania
Jane Drexler	Akron	Ohio
Rose du Plessis	Reno	Nevada
H Dubuisson	Denver	Colorado
Laurie Duke	Chicago	Illinois
Shawn Duke	Los Feliz	California
Shawn Duke	Los Angeles	California
Heather Duncan	Coloma	Michigan
James Duncan	Miami	Florida
Elizabeth Dunham	Mount Arlington	New Jersey
Lynn Dunn	Deltona	Florida
Crystal Durham	Reidsville	North Carolina
Marc Durham	Reidsville	North Carolina
Josef Dustin Tracy	Cambridge	Massachusetts
debra dworaczyk	Nevada City	California
Holly Dyer	Troy	Michigan
E. Dyer	San Francisco	California
Mark Dyer	Hauppague	New York
Torchee Dyer	Ladson	South Carolina
Peggy E. Corder	Tyler	Texas
Burnis E. (Gene) Tuck	Fresno	California
Harold E. Robinson	Talladega	Alabama
Gloria E. Sapia-Bosch	Falls Church	Virginia
Iris E. Pierce	Ramona	California
Robert E. Dempsey	Novi	Michigan
Ryan Eakin	Thurmont	Maryland
Julia Earl	Atlanta	Georgia
Chandra Easton	Santa Barbara	California
Sarah Eberhardt	Chester	New Jersey
Nanette Echols	St. Paul	Minnesota
Dave Eckelkamp	New Haven	Missouri
Michele Edgcomb	Melbourne	Florida
Scott Edmondson	San Francisco	California
Carol Edwards	Woodland Park	Colorado
Dave Edwards	Olmsted falls	Ohio
Matt Eggers	Menlo Park	California
Tracey Ekker	Coronado	California
Jannet Elaine Hudson	Ehrhardt	South Carolina
John Elder	Woodland Hills	California
Betty Elkin	Glenview	Illinois
Perrin Elkind	Oakland	California
Mary Ellen Brody	Oakland	California
Laura Ellenwood	Montpelier	Vermont
Jeanette Elliott	Columbus	Georgia
Zenda Elshere	Garden City	South Carolina
Beth Emberton	Branson	Missouri
Irucka Embry	Knoxville	Tennessee
Obiora Embry	Knoxville	Tennessee
Brenda Emerich	Temple	Pennsylvania
Marilyn Engelman	Coram	New York
Kate Englund	Chicago	Illinois
Raymond Ensing	San Luis Obispo	California
Tom Entwistle	Santa Barbara	California
Arlene Epperson	La Crosse	Florida

Name	City	State/Country
Senka Erikson	Victoria	Canada
Patricia Ernest	Port St. Lucie	Florida
Steven Ertel	Lawrenceville	New Jersey
David Erwin	Valparaiso	Indiana
Susan Espey	Rio Linda	California
Arthur Espinoza	Denver	Colorado
Danielle Esposito	Brooklyn	New York
Ann Estep	Cupertino	California
Daniel Estermann	London	United Kingdom
Douglas Estes	San Francisco	California
Gregory Esteve	Lake Wales	Florida
William Estrada	Chicago	Illinois
D Eugene Wedge	Oak Park	California
Renee Euler	Oak Park	Illinois
V Evan	Chicago	Illinois
Karen Evans	Largo	Florida
Dinda Evans	San Diego	California
Luke Evans	Kent	United Kingdom
Patricia Evans	Las Vegas	Nevada
Carter Everett	Winter Park	Florida
Walker Everette	Twp of Washington	New Jersey
Kathy Evilsizer	Crystal River	Florida
Susan Evilsizer	Elyria	Ohio
Robert Evilsizer	Crystal River	Florida
Lois Evron	Cedarhurst	New York
Cynthia Faisst	Irvine	California
Pete Falca	Jersey	New Jersey
Janet Falcone	Goffstown	New Hampshire
Shari Falomir	D.F.	Mexico
Nicolas Fancher	Deltona	Florida
Lizbeth Farias	Miami	Florida
Jeffrey Farland	Westport	Massachusetts
Erin Farlow	Auburn	Indiana
Robin Faucher-Osborne	Paso Robles	California
Gina Fedon	Olathe	Kansas
Marsha Feimster	Greenville	South Carolina
Janet Feldman	Barrington	Rhode Island
Valerie Fenske Howard	Clarksville	Tennessee
Laura Ferejohn	Irvine	California
M Ferguson	Greenwood Village	Colorado
Joanne Ferguson	Spotsylvania	Virginia
Charles Ferrante	Miami	Florida
Robert Ferrari	Eastham	Massachusetts
Alyssa Ferry	Chêne-Bougeries	Switzerland
Daniel Fewster	Baltimore	Maryland
Anastasia Fiandaca	San Francisco	California
Kelly Fielden	Owings Mills	Maryland
Victoria Filinuk	Browns Mills	New Jersey
Jeremy Fink	Keene	New Hampshire
Ethan Finkelstein	Thorofare	New Jersey
Sigmund Finman	Canonsburg	Pennsylvania
Anne Firestone	Oxford	Indiana
Sonja Firing	Renton	Washington
Bob Fischella	Tucson	Arizona
Laura Fischer	New York City	New York
Roz Fischer	Beltsville	Maryland
Samantha Fish	Commack	New York
Douglas Fisher	Santa Barbara	California
Keith Fisher	Ardley	Pennsylvania
Mary Fisher	Bluffton	Indiana
Annie Fitch	Lindsay	Oklahoma
Arthur Fitzgerald	North Bergen	New Jersey
Peter Flack	W. Babylon	New York
Gail Flanagan	Augusta	Georgia
Eileen Flanagan	Pt. St. Lucie	Florida
Silke Fleischer	Sykesville	Maryland
Glenn Fleischman	Bronx	New York
Richard Fletcher	San Diego	California
Thelma Fligel	Massapequa Park	New York
Douglas Flint	Denver	Colorado
Lynda Flood	Brooklyn	New York
Alfredo Flores	Hempstead	New York
Patricia Flores	Trenton	New Jersey
Rick Flory	Jackson	Wyoming
Flo Flowing	Fairfield	California
Erin Flynn	Woodland Hills	California
Robert Focht	Union City	New Jersey
Grant Foerster	Kensington	California
Bill Foley	Denver	Colorado
Gloria Forbes	Rochester	New York
Doreen Forbes	London	Delaware
Garry Ford	McConnellsburg	Pennsylvania
Michael Ford & Richard Marks	Watsonville	California
Chad Fordham	Traverse City	Michigan
Tyler Forman	Phoenix	Arizona
Jennifer Forrest	Teaneck	New Jersey
Michael Forte	Palos Verdes	California
Mike Fortune	Brevard	North Carolina
Matthew Foss	Palmer	Massachusetts

Name	City	State/Country
Mark Foy	Berkeley	California
Name	City	State/Country
Andrea Fraley	New York	New York
Lawrence Frank	Atlanta	Georgia
Mark Fraser	Arlington	Texas
Wendy Frederick	Brandon	Vermont
Misha Fredericks	Millbrook	New York
Curtis Freeman	Kent	Washington
Carrie Friedenberg	Bethpage	New York
Anthony Friend	Carpinteria	California
Jeff Frontz	Columbus	Ohio
Randy Fuehrer	San Diego	California
Gary Fulford	Tulsa	Oklahoma
Stephen Fuller	Norfolk	Virginia
ann g. johnson	new albany	Indiana
Michelle Gaines	Cassatt	South Carolina
Ronald Galbavy	Agoura Hills	California
Anita Gale	Covington	Kentucky
Deanna Gallimore	Las Vegas	Nevada
Cecilia Galup	crawfordville	Florida
Jeff Gammon	Oakland	California
Karen Garber	Arlington	Massachusetts
Paul Garber	Berkeley	California
Jose Garcia	Los Angeles	California
Markus Gärdback	Varberg	Sweden
Mike Garnett	Tallahassee	Florida
David Garrett	Islamorada	Florida
John Garrick	St Albans	United Kingdom
Courtney Gartin	San Jose	California
Tina Gaston	N. Fond Du Lac	Wisconsin
Nancy Gathing	Madison	Wisconsin
Sheryl Gaudette	Hudson	New Hampshire
Jo Gauthier	Evansville	Indiana
Cindy Gawne	Gladstone	Michigan
Jamia Geer	North Las Vegas	Nevada
Craig Geiger	San Diego	California
Yehuda Gelb	Rochester	New York
Michael Gelineau	Holyoke	Massachusetts
Robert Gendron	Winchester	Virginia
Greg Gentry	Ruckersville	Virginia
John Gentry	Cincinnati	Ohio
Christy George	Williamstown	Kentucky
Pandora George	Manchester	Missouri
Debra Gerheart	Decatur	Illinois
Jill Gershen	Germantown	Maryland
Kate Gervits	Bronx	New York
Caroline Getz	Hollywood	Florida
Debbie Gibbs-Halm	Grand Blanc	Michigan
Jill Gibson	Oakland	California
Lee Gibson	Dallas	Texas
Monique Gilbert	Miami	Florida
Eren Giles	Austin	Texas
Mary Gill	Arcata	California
Greg Gill	Jonesboro	Georgia
Michael Gill	Oxford	Ohio
David Gillanders	State university	Arkansas
Janette Gillelan	Zeeland	Michigan
Donna Gilliam	Fresno	California
Pearl Gilman	Seattle	Washington
Richard Gilman	Kalamazoo	Michigan
Martha Gilmore	Carmichael	California
John Giordano	Deerfield Beach	Florida
Greg Giorgetti	Oakley	California
Gail Gittlitz	Tellico Plains	Tennessee
Jacob Givens	Alexandria	Virginia
Laurie Glaser	Saint Paul	Minnesota
Linda Glasier	Olympia	Washington
Sarah Glass	Highland	Indiana
Benno Gliemann	Varel	Germany
Katie Glodzik	Kempton	Pennsylvania
Marcia Glover	Bellevue	Washington
Sasha Goders	Edmonton	Canada
Clary Goedert-Gasper	Renton	Washington
Laura Goldblatt	Princeton	New Jersey
Davina Golden	North Canton	Ohio
Lori Golden	Los Angeles	California
Chris Goldstandt	Newberg	Oregon
Eduardo Gomez	Rancho Cucamonga	California
Leonor Gonçalves	Porto	Portugal
Robert Gonzales	Clayton	New Jersey
Michelle Gonzales	West Islip	New York
Barbara Goodman-Fischtröm	Minnetonka	Minnesota
Morgen Goodroe	Dallas	Texas
Alan Goodson	Los Angeles	California
Patty Goon	Hudson	Massachusetts
Joan Gordon	Santa Barbara	California
Lewis Gorman III	Cherry Hill	New Jersey
David Gougler	Santa Rosa	California
Jason Gracia	Santa Rosa	California

Name	City	State/Country
Maria Graciela Ceballos Ruiz	México	Mexico
Jeannie Graham	Del Mar	California
Kimberley Graham	Coronado	California
Luke Grannis	Playa del Rey	California
Andrew Grant	Madison	Wisconsin
Theresa Gratis	Buzzards Bay	Massachusetts
Scott Gray	Winnipeg	Canada
Rhyan Grech	Pittsfield	Massachusetts
Mike Green	Memphis	Tennessee
Peggy Green	Margate	Florida
M Green		Missouri
Sean Greenwald	College Station	Texas
Duncan Gregory	Olney	Maryland
Andrea Greiling	Flagstaff	Arizona
Susan Grenewald	Fernandina Beach	Florida
Eleanor Grewal	Middletown	Delaware
Ann Grewal	Middletown	Delaware
Tom Grier	Albuquerque	New Mexico
Jenna Griffin	Springboro	Ohio
Kerrin Griffith	New York	New York
David Grimesey	Sioux City	Iowa
Cody Grimm	San Francisco	California
Elizabeth Grimwade	Chicago	Illinois
Sandra Gritz	Mableton	Georgia
Richard Groshong	Columbus	Ohio
Ravi Grover	Chicago	Illinois
Ronald Grubb	Rockford	Illinois
Jessica Guidry	Duson	Louisiana
Amy Guidry	Opelousas	Louisiana
Raena Guillotte	Exeter	Rhode Island
Laura Gully	Reno	Nevada
Janine Gunderman	Sleepy Hollow	New York
Darryl Gunderson	San Buena Ventura	California
Lori Gunnell	Pasadena	California
MBeth Gunner	La Mesa	California
Jaclyn Gurule	Grants Pass	Oregon
Robin Gustus	Jacksonville	Florida
Diane Gutierrez	Cape Coral	Florida
James H. Reynolds III	Independence	Missouri
John H. Taylor	Wilmington	Delaware
Philip H. Coe	Wimberley	Texas
Stacy Haag	Sarasota	Florida
Antonia Haber	Miami	Florida
Matthew Habich	Austin	Texas
Patricia Hackemack	Kensington	California
Jen Hadraba	Naperville	Illinois
Sarah Hafer	Rio Rancho	New Mexico
Richard Hagen	Brooklyn	New York
Gayle Hales	Charlotte	North Carolina
Eva Haley	Tallahassee	Florida
Wayne Hall	Gilbert	Arizona
Jim hamilton	Northridge	California
Christine Han	New York	New York
Holly Hancock von Guilleaume	Tucson	Arizona
Sarah Hanka	Sarasota	Florida
Kelly Hanlon	Mountain Top	Pennsylvania
Laurie Hansen	Walnut Grove	Minnesota
John Hanson	Leland	Illinois
Art Hanson	Lansing	Michigan
Kristin Hanson	Anchorage	Alaska
Rita Harahap	Jakarta Utara	Indonesia
Clint Harder	Madison	Wisconsin
Dian Hardison	Cocoa	Florida
Mark Hargraves	Oakland	California
Lana Hargreaves	Kenedy	Texas
Andrea Harris	Mount Laurel	New Jersey
Christopher Harrison	Waikoloa	Hawaii
Daintre Hart	Brooklyn	New York
Karryn Hart	DeGraff	Ohio
Emily Hart	Meadow Vista	California
Randy Hartwig	West Des Moines	Iowa
Joseph Harty	Santa Rosa	California
Joan Harvey	Santa Barbara	California
Allan Haseltine	Putnam	Connecticut
Joe Haslett	Catskill	New York
Marjorie Hass	Hartshorne	Oklahoma
Christi Hatcher	New York	New York
Daniel Hatfield	Portland	Oregon
Melissa Hatfield	Santa Monica	California
Bonnie Haufe	williamsburg	Virginia
Keir Haug	Saint Louis	Missouri
Lisa Haugen	Kearney	Missouri
Paula Haughney	Old Bridge	New Jersey
Corwin Haught	Grand Forks AFB	North Dakota
Alex Hawley	Doylestown	Pennsylvania
Norma Hay	Boca Raton	Florida
Marguerite Hayde	Brooklyn	New York
Amber Hayden	N. Haverhill	New Hampshire
Sara Hayes	Long Beach	California

Name	City	State/Country
Lori Hayes	CONCORD	North Carolina
Lisa Hayes	Peoria	Illinois
David Haymon	Brockport	New York
Brian Haynes	Oshkosh	Wisconsin
Barbara Hayward	Honolulu	Hawaii
Thomas Headrick	Redford	Michigan
Dr. Healy Hamilton	Berkeley	California
Chris Heaney	Chapel Hill	North Carolina
Sarah Heaney	Anglesey	United Kingdom
Richard Heaning	No Massapequa	New York
Russell Heath	Steuben	Maine
John Heaton	Kirksville	Missouri
Nick Hedlund	Portland	Oregon
Grace Heicher	University Park	Pennsylvania
Melina Heiley	New York	New York
Jeanette Heinrichs	Pittsburgh	Pennsylvania
Mary Helen Pederson	Cathlamet	Washington
Karen Hendershot	Poway	California
Jane Henderson	Flourtown	Pennsylvania
Dorea Henderson	Incline Village	Nevada
Laura Henderson	Michigan City	Indiana
Viviana Henriques	Lisboa	Portugal
Colleen Henry	Pitman	New Jersey
Tracy Hensley	West Chester	Ohio
Jaxie Heppner	Beebe	Arkansas
Dr. Herbert Vaughan	Stamford	Connecticut
Sam Hergenrather	Sebastopol	California
Olga Hernandez	Baldwin Park	California
Elizabeth Hernandez	Union City	New Jersey
Lynda Hernandez	Huntington Beach	California
Lenora Hernandez-McKee	Bumpass	Virginia
tomas herndon	tucson	Arizona
Martha Herrero	Morton	Texas
Stephen Herrington	Eldorado Springs	Colorado
Jeanette Hess	Slingerlands	New York
John Hetts	University City	Missouri
Elyse Heyman	Monroeville	Pennsylvania
Nikki Hietala	Superior	Wisconsin
Rose Hilbert	Milwaukee	Wisconsin
Patricia Hill	Annandale	Minnesota
Melissa Hill	Irvine	California
Dr. Hillel Lazarus	Panorama City	California
Blaine Hilton	Portage	Indiana
Karen Hinderstein	Margaretville	New York
Maxine Hirschel	Boynton Beach	Florida
Larz Hitchcock	Madison	Wisconsin
Charlene Hoag	New Port Richey	Florida
Lisa Hobson-Webb	Winston-Salem	North Carolina
Lisa Hoch	Superior	Wisconsin
Travis Hodges	Mattawan	Michigan
Tash Hodges	Fayetteville	Ohio
L Hoeflich	Chicago	Illinois
Name	City	State/Country
Eileen Hoenig	Paradise	California
Michael Hoffberg	Wayne	Pennsylvania
Farrah Hoffman	Indianapolis	Indiana
Carol Hoffman	Fort Lauderdale	Florida
Kim Hoffman	Portland	Oregon
Paul Hofheins	Toanwanda	New York
Shana Holberton	Oakland	California
Bob Holder	Mt Sinai	New York
Heidi Holeman	Norman	Oklahoma
Tom Holford	Leadville	Colorado
Deanna Holland	Toronto	Canada
James Holley	Santa Cruz	California
Allyson Holliday	Tuscaloosa	Alabama
Alicia Hollinger	Los Angeles	California
Denise Holloway	Fayetteville	West Virginia
Ginny Holm	Gresham	Oregon
Jessica Holt	Boulder	Colorado
Lynne Holt	Lake Forest	California
Regina Holt	Elkridge	Maryland
Barb Holtz	NY	New York
Beverly Hood	Juda	Wisconsin
Triska Hoover	Silver Spring	Maryland
Zoe Hope	Queensland	Australia
Helen Horine	Golden	Colorado
Judith Hornady	Mobile	Alabama
Aileen Horowitz	Morton Grove	Illinois
Abigail Horro	Alicante	Spain
Melanie Horrocks	Fort Leonard Wood	Missouri
Harriet Horton	Saginaw	Texas
Richard Hoskins	Olympia	Washington
Stanley Hosterman	Cleveland	Ohio
Jason Hotchkiss	Austin	Texas
C Hough	Council Bluffs	Iowa
Nancy Houghton	Nevis	Minnesota
Keith Houser	Bellevue	Washington
Dean Houser	Monroe	Michigan

Name	City	State/Country
Brad Houseworth	St. Joseph	Michigan
Erika Hovater	North Las Vegas	Nevada
Brian Howard	Orange	Connecticut
laura howe	los angeles	California
Susan Howe	Oceano	California
Linda Hoyt	St. Louis	Missouri
Athena Hsieh	Andover	Massachusetts
D.P.H. Huang	Flushing	New York
Juliet Hubbard	Towson	Maryland
PJ Hubbard	Rochester	Minnesota
Raymie Huerta	Chula Vista	California
Courtney Huggins	Bexley	Ohio
Marjorie Hughes	White Plains	New York
Azul Hull	San Leandro	California
Michelle Hummer	Annnville	Pennsylvania
Jane Humphrey	St. Louis	Missouri
Heidi Hunt	Rockport	Maine
Jennifer Hunter	Jewett	New York
Marian Huq	Voorhees	New Jersey
Debbie Hurwitz	pleasantville	New York
Tom Hutchins	Santa Rosa	California
Shane Hutte	Indianapolis	Indiana
Donna Hyde	Paragould	Arkansas
Michael Hyde	San Francisco	California
Eldeliza I. Quevedo	Sweetwater	Florida
Claire Ianno	New York	New York
Megan Ihrig	Ridgeway	Canada
Lillian Ingster	Great Falls	Virginia
Emil Ippolito	Chatham	New Jersey
Francisco Iriarte	Pompton Plains	New Jersey
Mustafa Isilak	Istanbul	Turkey
Kay Izlar	Arcata	California
Gerald J Dalton	Naperville	Illinois
Mark J Burwinkel	Cincinnati	Ohio
Alan J. Frumkin	Houston	Texas
Denise J. Tartaglia	New York	New York
Catherine J. Circo	Glendale	California
Alan Jackson	Uniondale	New York
Carolee Jackson	Oceanside	California
Tom Jackson	denver	Colorado
Susan Jackson	Farmington	New Mexico
Jim Jacobs	Cincinnati	Ohio
Sandie Jacobs	Pittsburgh	Pennsylvania
Paul Jacobson	Idyllwild	California
Denis Jahnke	Appleton	Wisconsin
Behroze Jaikaria	Lawrenceville	New Jersey
G James Jr	Killeen	Texas
Mary Jane Wright	Longmont	Colorado
Mary Jane Nolan	Pittsburgh	Pennsylvania
Karen Jarrell	Fowler	Indiana
Robin Jatko	Brooklyn	New York
Peggy Javellana	Apopka	Florida
Jenny Jay	Somerville	Massachusetts
Betty Jean Herner	Strongsville	Ohio
Tracy Jenkins	Lake Stevens	Washington
Melodi Jenkins	Deltona	Florida
Mark Jenkins	Deltona	Florida
Dr. Jeremy Hanna	Auburn	Alabama
Paul Jerskey	seattle	Washington
Mary Jo Brinker	New Kensington	Pennsylvania
Bobbi Jo Chavarria	Fontana	California
Mary Jo Knox	Pittsburgh	Pennsylvania
Elizabeth Jobson	Lake Hill	New York
William John Divney	New York	New York
Michael John Mayo	San Francisco	California
Jaki Johnsen	NY	New York
Kate Johnson	Annapolis	Maryland
Charlene Johnson	Goleta	California
Caitlin Johnson	Overland Park	Kansas
Dedra Johnson	New Orleans	Louisiana
Dan Johnson	Monroe	Michigan
Jillian Johnson	La Crescenta	California
Vicki Johnson	Kansas City	Missouri
Emily Johnson	San Rafae	California
Bettemae Johnson	Belton	Texas
Lynda Johnson	Portland	Oregon
Sandra Johnson	St. Cloud	Minnesota
Gregory Johnston	Decatur	Indiana
Kathy Johnston	Fairfield	California
Steve Johnston	Hollister	California
Michael Joines	Arlington	Texas
Isabelle Jolly	El Segundo	California
Robert Jonas	Westfield	New Jersey
Beth Jones	Monticello	Iowa
Cherie Jones	Bradenton	Florida
Miriam Jones	Mobile	Alabama
Megan Jones	Tuakau	New Zealand
JACKIE JONES	davis	Oklahoma
Jenna Jonteaux-McClay	Fox River Grove	Illinois

Name	City	State/Country
Kris Jordan	Riverview	Michigan
Laura Jordan	Albion	Michigan
Lawrence Joseph	Haslett	Michigan
Barbara Julien	Kent City	Michigan
Roberta K Wright	Alameda	California
J. K. Fort-Strietzel	Meadowlands	Minnesota
Julie K. Coultres	Guthrie	Oklahoma
Judith Kahle	Fairfield	California
Kristina Kaiser-Hipp	Oakmont	Pennsylvania
Kristen Kalakos	Pittsburgh	Pennsylvania
Ed Kanczewski	Pompton Plains	New Jersey
Nina Kanga	Sun Valley	California
Sidney Kantor	Monroe Twp	New Jersey
Jessica Kaplan	Alexandria	Virginia
Sandra Karlsvik MD	Fox Island	Washington
David Karowe	Kalamazoo	Michigan
E. Karsten Smelser	Minneapolis	Minnesota
Marian Kart	Delray Beach	Florida
Annina Kaski	espo	Finland
JD Kaspar	St. Charles	Illinois
Linda Kate Beswik	London	Great Britain
Mary Kate Frank	Lansdale	Pennsylvania
Alfred Katz	Old Tappan	New Jersey
Toshya Kauffman-Smith	Lake Oswego	Oregon
Denise Kaufman	Chicago	Illinois
Murray Kaufman	Fair Lawn	New Jersey
Robin Kaufman	San Francisco	California
Michael Kavanaugh Jr	Palmyra	Virginia
Marshall Kavanaugh	Ewing	New Jersey
Elizabeth Keating	Dallas	Pennsylvania
Bill Kedem	San Francisco	California
Nina Keefer	Platteville	Colorado
Dorothy Keeler	Anchorage	Alaska
Laura Kefauver	San Antonio	Texas
Suzanne Kehr	Oxford	Ohio
Joanne Kelly	Monterey	California
Wayne Kelly	Ashland	Oregon
Melissa Kelly	Merced	California
Matt Kelly	New Ashford	Massachusetts
Katharina Kempf	Annandale-on-Hudson	New York
Jeffrey Kempster	lexington	Kentucky
Katrina Kendall	San Clemente	California
Roman Kernitski	Colonia	New Jersey
Lauri Kero	Tampere	Finland
Raymond Kervahn	Saint Petersburg	Florida
Laura Kessler	Kent	Ohio
Lori Ketterlin	Redmond	Washington
Elizabeth Key	Leicester	North Carolina
Jenn Khufash	Long Beach	California
Kathryn Kielbasa	Annerley	Australia
C. Kim Grant	Tallahassee	Florida
Anthony Kimmons	Houston	Texas
Jeanette King	Livermore	California
Ashley King	Richmond	Virginia
Lilo Kinne	Weehawken	New Jersey
Michael Kirby	Northfield	Minnesota
Margaret Kirk Pedroza	Pflugerville	Texas
Chris Kirker	Eldersburg	Maryland
Kathy Kirkland	Key West	Florida
Randy Kirkpatrick	Oswego	Kansas
Melody KirkWagner	Bellevue	Washington
Lark Kirkwood	Oklahoma City	Oklahoma
Irene Kitzman	Hamden	Connecticut
Colleen Kjems	Neptune City	New Jersey
Pamela Kiono	Grand Forks	North Dakota
Sara Kleinbaum	Hackensack	New Jersey
Sheri Klingensmith	Fairfax	Virginia
Michael Kloor	Ashland	Oregon
Klara Kmetovich	Dubrovnik	Croatia (Hrvatska)
Ingrid Kneller	Hythe	United Kingdom
Tom Knepper	Los Osos	California
Jason Knight	Edinburgh	United Kingdom
Phill Knight	Lomita	California
Mae Knight	Park Forest	Illinois
Linda Knoll	Royal Palm Beach	Florida
Gregory Koch	Anaheim	California
Richard Kociban	West Mifflin	Pennsylvania
Ellen Kohjima	Auburn	Washington
John Kohler	Daly City	California
Deborah Koken	Costa Mesa	CA
Brittany Kolyznyk	Upland	California
Melanie Konrad	Sand Lake	Michigan
Angela Korpar	Henrietta	New York
Michael Korte	Brandon	Florida
Gary Kosman	Granada Hills	California
Melissa Koval	Dansville	Michigan
Kelly Kowalski	College Park	Maryland
Merrill Kramer	Halandale	Florida
Jeff Krause	Hinsdale	Illinois

Name	City	State/Country
Greg Krenek	Oceanside	California
Adelheid Kresse	Graz	Austria
Dale Krewson	Lebanon	Oregon
Karin Kroh	Seattle	Washington
Amy Krueger	Darein Center	New York
Belle Krumholz	Thomasville	Georgia
Susan Kruthers	Palos Park	Illinois
Sara Kube	philadelphia	Pennsylvania
Dawn Kudish	Boca Raton	Florida
Jennifer Kugel	San Diego	California
Jeremy Kuhn	Grand Junction	Colorado
Noel Kumpf	everett	Washington
Sophia Kuo	Seattle	Washington
Kimberly Kurcab	Irvine	California

Name	City	State/Country
Jany's Kuznier	Vernon	New Jersey
Linda L. Wiley	Homer	New York
Gary L. Campbell	Conroe	Texas
Alice L. Logan	Pittsburgh	Pennsylvania
Pedro L. Sanabria	Riverdale	Georgia
Terry L. Stagman	Oak Park	Illinois
Joseph Labuda	Middletown	New York
Joshua Laff	Seattle	Washington
Stephanie LaFlesch	Missoula	Montana
Andy LaHaie	Muskegon	Michigan
Jesse Lamb	Crystal Springs	Mississippi
Cynthia Lamontagne	Los Angeles	California
Claudine Lampson	Galesburg	Illinois
Earl Lane	Hannibal	Missouri
DonLee Lane	Lakewood	Colorado
Samantha Lange	Hartly	Delaware
Nick Langill	Spokane	Washington
Brenda Lanning	Levittown	Pennsylvania
Skott Lanning	San Diego	California
Jeff Lapides & Diane Sands	Sierra Madre	California
Kate Larsen	Oakland	California
Amy Larsen	Fullerton	California
Mary Larson-Edwards	Madrid	Iowa
Jacqueline Lasahn	Richmond	California
Frank Laschiazza	Cicero	Illinois
Monica Laura Creus Ureta	Buenos Aires	Argentina
Sharon Lavender	Broussard	Louisiana
Laurie Laventhall	Fruitland Park	Florida
VM Lawrence	Bronx	New York
Sylvia Lawrence	Auburn	Washington
Thu Le	Brooklyn	New York
Alana Lea	Blaine	Washington
Kathleen Leavey	Somerville	Massachusetts
William Leblanc II	Biloxi	Mississippi
Joseph LeBoeuf	Whitinsville	Massachusetts
haidee leclair	berlin	Massachusetts
Tena LeDoux	Superior	Wisconsin
Sarah Lee	Dupage	Illinois
Jack Lee	Blountsville	Alabama
Kevin Lee	Dupo	Illinois
Tucker Lee Bennett	Maysville	West Virginia
S Leff	San Francisco	California
Matthew Lehman	San Diego	California
Helen Lembeck	Chula Vista	California
Christine LeMieux	Topsham	Maine
Denise Lendway	Orlando	Florida
Donna Leonard	Lincoln	Rhode Island
Imelda Leros	Quezon City	Philippines
Nancy Lerner	Seattle	Washington
Connie Lersch	Katy	Texas
Larry Lesser	Boynton Beach	Florida
David Lester	Albuquerque	New Mexico
Michael Letendre	Portsmouth	New Hampshire
Stephen Levine	Richardson	Texas
Sandy Levine	La Crescenta	California
Emily Levitt	New Hamburg	New York
Timothy Lewis	Chandler	Arizona
Michael Lewis Donmoyer	Lemoine	Pennsylvania
Tom Lewis	Pittsfield	Massachusetts
Geneva Lewis	Panama City	Florida
Jan Libby	Santa Monica	California
Mollie Liberman	Chesterfield	Missouri
Kurt Lieber	Huntington Beach	California
Jane Lightning	Birmingham	Alabama
Andrew Limburg	Tallahassee	Florida
pamela lind	San Antonio	Texas
Bethany Linder	Austin	Texas
Darian Lindle	Seattle	Washington
Jennifer Lindner	Boca Raton	Florida
Anna Lindstrand	Stockholm	Sweden
Robin Linn	Andover	Massachusetts
Donna Liolis	West Franklin	New Hampshire
Jennifer Liptow	Brooklyn	New York
Kitrina Lisiewski	Monroe Township	New Jersey

Name	City	State/Country
Mario Listig	San Diego	California
Tina Littleman	Sedona	Arizona
Patsy Livingston	Wheeling	Illinois
Richard Livingston	San Francisco	California
Nora Livingstone	Hamilton	Canada
Alexander Lobkovsky	Allston	Massachusetts
Sara Loboda	Romeoville	Illinois
Joanie Locie	Columbus	Georgia
Charlene Locke	Hayward	California
Sandra Lockhart	Arlington	Virginia
Niecy LoCricchio	Highlands Ranch	Colorado
Otto Loenneker	Los Gatos	California
Thomas Logan	Ooltewah	Tennessee
Caroline Logan	Grinnell	Iowa
Richard Long	Kearny	New Jersey
Joseph Longo	Rochester	New York
Sharon Looking Woman	Tyrone	New Mexico
Angela Lopez	Westminster	Colorado
Lonnie Lopez	Bakersfield	California
Randi Lorah	Mechainsburg	Pennsylvania
Dian Lord	Bonney Lake	Washington
Mary Lou Grolimond-Olson	Miami	Florida
Robert Loucks	Big Bear Lake	California
Amy Lourenco	Leesburg	Virginia
Jacquie Lowell	San Diego	California
Indra Lowenstein	San Francisco	California
Shelley Lubiens	Bismarck	North Dakota
Jennifer Lubinsky	Merrick	New York
Leann Luckett	Statesboro	Georgia
Gary Ludi	Roswell	Georgia
Miranda Lukatch	Chicago	Illinois
Jim Lunsford	Alpine	California
Valerie Lurie	Tilton	New Hampshire
Tom Lusignan	Lanesborough	Massachusetts
Danielle Luttenberg	Brighton	Massachusetts
Rev. Lyle D. Linder	FRANKLIN	New York
Micki Lyn Szabo	Garland	Texas
Janet Lynch	Brunswick	Maine
Gail Lynch	Nashua	New Hampshire
Rose Lynd	Bronxville	New York
andy lynn	douglasville	Georgia
Cynthia Lynn	Palmer	Michigan
Terri Lynn Boehler	Halifax, Nova Scotia	Canada
J. Lynn Mundinger	Mission Woods	Kansas
Malika Lyon	Lawrence	Kansas
Anthony Lyons	Lamar	Missouri
James M Nordlund	Lakin	Kansas
James M Nordlund	Lakin	Kansas
Airton M. Junior	Porto Alegre	Brazil
Sue M. Watkins	Fulton	Mississippi
Amanda M. Lynn	Mountain View	California
Elizabeth Mac Dougall	San Diego	California
Nicole Macaluso	Rancho Santa Fe	California
June MacArthur	Santa Rosa	California
George Macaulay	Hillsboro	Oregon
Orion Macdonald	Wellfleet	Massachusetts
Doug Macdonald	Sheffield	Massachusetts
Taylor MacDonald	Philadelphia	Pennsylvania
Sharon MacDonald	Medford	Oregon
Andrew Macginitie	Roxbury	Connecticut
Frederick Mackey	Denver	Colorado
Donna Macro	Auburn	New York
Robert MacVittie	Williamsville	New York
Neahle Madden,RN	Santa Rosa	California
Rohit Mahajan	Bloomfield Hills	Michigan
Herushia Maharaj	Waltham	Massachusetts
Rebecca Main	London	United Kingdom
Marjo Maisterra	Los Angeles	California
Lennie Major	Mounds View	Minnesota
Lorri Makela	Port Richey	Florida
Mark Mallchok	Evanston	Illinois
Tracy Mallozzi	Los Angeles	California
Ward Mamlok Jr	San Jose	California
Denise Maney	Madison	Wisconsin
Judi Mangan	Pittsburgh	Pennsylvania
Michelle Mangio	East Weymouth	Massachusetts
Bridget Manley	Los Angeles	California
Heather Manlove	Oakhurst	California
Robert Manning	Johnsburg	New York
Dale Manning	Syracuse	New York
Veronica MAnthei	Hewitt	New Jersey
Heidi Marcoux	Manchester	Connecticut
Theodore Marenberg	Lanoka Harbor	New Jersey
Rebecca Margiotta	Madison	Wisconsin
Coleen Marie Lyon	Denver	Colorado
Justin Marino	Poland	Ohio
Marie Mark	Santa Barbara	California
John Mark Robertson	Toronto	Canada
S Markell	Costa Mesa	California

Name	City	State/Country
Alec Marken	Lake Forest	California
Susan Marone	Forney	Texas
Susan Marsch	Lewisberry	Pennsylvania
Lisa Marshall	Houston	Texas
Kristin Marshall	Keyport	Washington
Deena Martin	Redondo Beach	California
Ann Martin	Santa Barbara	California
Adele Martin	Redondo Beach	California
Michele Martin	McDonough	Georgia
Heather Martin	Jonesboro	Georgia
Cassidy Martinez	Portland	Oregon
Maria Martinez	Port Hueneme	California
Kim Martinez	Pendleton	South Carolina
Rosemarie Martorana	Long Island City	New York
Connie Mason	Chattanooga	Tennessee
Gloria Mason-Gidcumb	Ferrum	Virginia
Emily Massarotti	Richfield Spa	New York
Roger Massey	Golden	Colorado
Rosemary Massie	Waverly	Ohio
Julien Massol	Shanghai	China
Patricia Mast	Tallahassee	Florida
Jamie Masterson	Glenside	Pennsylvania
Rik Masterson	portland	Oregon
Danielle Masterson	Voorheesville	New York
Mary Mathews	Lake Forest	Illinois
Erik Mathews	Denver	Colorado
M. Mathewson	Culver City	California
Julie Mathis	Tarpon Springs	Florida
Peter Matteson	El Cerrito	California
Abby Maxwell	Durham	North Carolina
Erin Mayberry	San Diego	California
Karen Mayer	Dallas	Texas
Marilyn Mayers	New York	New York
Joan Mazur	Brook Park	Ohio
Robert Mc Tighe	Southport	North Carolina
Tamaro McAfee	Okeechobee	Florida
Kelley McAnally	Fort Worth	Texas
Stephanie McAskin	Rochester	Michigan
William McCaffrey	Orlando	Florida
Kathy McCann	Milton	Wisconsin
Tom McCarter	Palo Alto	California
Peggy McCarthy	Eastlake	Ohio
Cathy McCartney	Montclair	New Jersey
Jennifer McClure-Gast	Durango	Colorado
Kim McCoy	Worcester	Massachusetts
Gish McCracken	Cowpens	South Carolina
Shawn McCracken	Kernah	Texas
Kris McCradic	Salt Lake City	Utah
Quincy McCray	Vallejo	California
Jen McCreary	Glen Burnie	Maryland
Col McDonald	miami	Florida
Janet McDonald	Stone Mountain	Georgia
Esther McDowell	Benton	Arkansas
Michael McFarland	Fresno	California
Lee McFarlane	Coventry	United Kingdom
Brian Mcgee	springvalley	Ohio
Aaron McGee	Madison	Wisconsin
Kellie McGettigan	Winfield	West Virginia
Gaye McGill	St Peters	Missouri
Mary McGilligan	Duluth	Minnesota
Michael McGirr	Tampa	Florida
Amy McGonagle	Burlingame	California
Julia McGovern	Waimea	Hawaii
Patty McGrath	Potomac	Maryland
Brad Mcgregor	Whistler	Canada
Name	City	State/Country
Sina McGriff	Trabuco Canyon	California
Matthew McGuire	Cheshire	Connecticut
Mary-Helena McInerney	Malden	Massachusetts
Eleanor McIntyre	Florissant	Missouri
Kelly McKee	Woodland Hills	California
Miles McKenzie	Sebastopol	California
Shoshanah McKnight	Santa Cruz	California
Eric McLearn	East Lansing	Michigan
Amanda McNeese	Leander	Texas
Catherine McNeff	Port Townsend	Washington
Michele McRae	Fort Worth	Texas
Michael McSwiggin	Santa Cruz	California
Erin Mcvov	Denver	Colorado
Laura Mears	Swansea	United Kingdom
Livia Medda	Cagliari	Italy
Kathleen Medina	Anacortes	Washington
Alison Megger	Tinley Park	Illinois
S Mehra	Auckland	New Zealand
Laura Meinhart	Greensboro	North Carolina
Martin Meisner	Lake Forest	California
Andre Meister	London	United Kingdom
Dennis Meizys	Columbia	Maryland
Dr. Melissa Hillman	Albany	California

Name	City	State/Country
Kathryn Melton	Atwood	Indiana
Terri Memeo	San Jose	California
Vince Mendieta	Austin	Texas
Barbara Mercaldo	Conroe	Texas
Jeffrey Mercer	Albany	New York
Robert Meredith	Corvallis	Oregon
Eda Meredith	Studio City	California
Loren Merrill	Dayton	Maine
Deb Merrill	Menlo Park	California
Isabel Meruelo	West Miami	Florida
Sheila Messer	Huntington	Massachusetts
Kelly Messimer	Mansfield	Ohio
Juneann Messina	Middle Island	New York
Marie Meszaros	Broadview Heights	Ohio
Steve Metcalf	Warwick	Rhode Island
Dawn Mettler	Rockbridge	Ohio
Gordon Metz	New York	New York
Emily Metz	New York	New York
Diane Meyer Simon	Montecito	California
Victorine Meyers	Covington	Kentucky
R. Michael McLellan	altoona	Pennsylvania
Adine Michaels	san francisco	California
Courtney Michelle	Longmont	Colorado
Suzanne Miles	Tenino	Washington
Meg Miles	jackson	New Hampshire
kathy miller	brownsville	Oregon
Doug Miller	Hamilton	New York
Judith Miller	Pasadena	California
M Miller	Spring	Texas
Kristie Miller	Kalamazoo	Michigan
Naomi Miller	Westmont	Illinois
Rosanna Miller	Venice	Florida
Sarah Miller-Kramer	Rochester	New York
Sara Millhouse	Galena	Illinois
Matthew Mims	Monroe	Connecticut
Brian Miner	West Allis	Wisconsin
August Mirabella	North Wales	Pennsylvania
DaniLe Miramontes-johnson	Viking	Minnesota
Denicolai Miranda	Simiane-Collongue	France
Michael Mirigian	Fresno	California
Amy Mitchell	Rindge	New Hampshire
Robert Mizar	Haleiwa	Hawaii
Jake Moav	Reshon	Israel
Jacqueline Mohan	Hillsborough	North Carolina
Susan Molloy	Castro Valley	California
Michael Monahan	Franklin Square	New York
Lisa Monda	Placitas	New Mexico
Peter Monopoli	Plymouth	Massachusetts
T. Monroe	RSM	California
Katie Montanaro	Pickerington	Ohio
Juanita Montano	Waukegan	Illinois
Dianne Monteiro	Springfield	Virginia
Susan Montross	Astoria	New York
Susan Moody	Terre Haute	Indiana
Jackie moore	santa clara	California
Jim Moore	Bloombsbury	New Jersey
Alexandra Moore	Ann Arbor	Michigan
Vandy Moore	Afton	Oklahoma
Tammy Moore	Casar	North Carolina
Sarah Moore	San Francisco	California
Rebecca Moore	New York	New York
Matt Moore	Miller Place	New York
Phyl Morello	Albrightsville	Pennsylvania
Bud Morello	Albrightsville	Pennsylvania
Elizabeth Moreno	Los Gatos	California
Diana Moreno-Alfonso	Fort Myers	Florida
Rachael Moretti	Novato	California
Tanya Morgan	Madison	Wisconsin
Sharon Morgenbesser	Framingham	Massachusetts
Jenni Morian	Arlington	Massachusetts
Krista Morin	Middleton	Massachusetts
Vira Moroz	Lakewood	Ohio
Lela Moroz	Lakewood	Ohio
Christopher Morray-Jones	Alameda	California
Marie Morris	West Hills	California
Francine Morris	Austin	Texas
Melissa Morris	Beaverton	Oregon
Colette Morrow	Oak Park	Illinois
Robert Morten	San Leandro	California
Sidney Moseley	Ashland	Oregon
Nick Mosiman	Lawton	Oklahoma
Tony Moss	Long Beach	California
Damita Moss	Lewisville	Texas
James Mosser	Pembroke Pines	Florida
Keli Motanagh	Creve Coeur	Missouri
Claudia Mottek	Reisterstown	Maryland
Lisa Moye	Goldsboro	North Carolina
Joe Moye	Tallahassee	Florida
Debbie Mrozinski	Buffalo	New York

Name	City	State/Country
Shirley Mullett	New Martinsville	West Virginia
Amy Mullin	Albuquerque	New Mexico
Bryan Mulvaney	Glendale	Arizona
Christina Muollo	Marlboro	New York
Andrew Murawa	Claremont	California
James Murphey	Fort Bragg	California
Barbara Murphy	Somers	New York
Judith Murphy	Albuquerque	New Mexico
Edward Musich	North Hollywood	California
Bruce Myers	Santa Rosa	California
Wayne Myers	Irvine	California
Jasmine Nacua	Keller	Texas
Joan Naeseth	Minneapolis	Minnesota
Rose Najia	San Rafael	California
Faith Nale	Duarte	California
BJ Narog	Fairview	North Carolina
Joseph Narvarte	Augusta	Georgia
Giovanni Natale	Santa Monica	California
Lianda Naude'	Johannesburg	South Africa
Alan Nayer	Mill Valley	California
Amber Neal	Tully	New York
Victoria Nee	Chicago	Illinois
Merle Neidell	St. James	New York
Denise Nelms	Balch Springs	Texas
Devon Nelsen-Maher	Camarrillo	California
Ramona Nelson	Pompano	Florida
Chris Nelson	Eagle Mountain	Utah
Kass Nesbitt	Moravia	New York
Emelia Nevers	Shoreline	Washington
Mark Neville	Morristown	Tennessee
Paula Newman	Covina	California
Marah Newman	La Jolla	California
Leone Newmark	Ft. Lauderdale	Florida
Joan Newton	Wells	Maine
Quyen Nguyen	San Diego	California
Trang Nguyen	North Quincy	Massachusetts
Zoe Nicholie	Minneapolis	Minnesota
Severine Nichols	Edmonds	Washington
Thomas Nicholson	Petaluma	California
Marysa Nicholson	East Setauket	New York
Emma Nickelson	Port Arthur	Texas
Matthew Niednagel	Flemington	New Jersey
Megan Nix	Upland	California
Christine Noe de Luna	Orlando	Florida
Linda Nolte	San Diego	California
Carla Nordstrom	Phoenix	Arizona
Linda Norelli	Austin	Texas
Kathleen Norman	Richland	Missouri
Joan Northrop	Surry	New Hampshire
Carissa Norton	Sacramento	California
Melissa Novak	La Mesa	California
Kai Novotny	Duluth	Minnesota
Barbara Nye	Erie	Pennsylvania
Kathy O'Brien	Arma	Kansas
Gerard O'Brien	Brea	California
Dorothy O'Connell	Fairplay	Colorado
Satu O'Connell	Allston	Massachusetts
Tom O'Leary	Tucson	Arizona
Christine O'Neil	Peoria	Illinois
Andrea O'Neill	Richmond	California
Christi Oates	orlando	Florida
Patrick Obranovic	Arnold	Missouri
Norma Obrian	sherwood park	Canada
Chris Obrien	Belchertown	Massachusetts
Laura Oesterhaus	Manhattan	Kansas
Doug Offield	Cottonwood	Arizona
Nanette Oggiono	Upton	Massachusetts
Mary Ogle	Cosby	Tennessee
Rochelle Ohman	Springfield	Oregon
Rita Oksanen		Finland
Sheryl Olejniczak	Auburndale	Florida
Gary Oliver	Abilene	Texas
Emmi Ollila	Jarvenpaa	Finland
Thomas Olmsted	State College	Pennsylvania
Jane Olson	Sidney	Montana
Kathleen Olszewski	Garfield Hts	Ohio
Katherine Oshana	Langhorne	Pennsylvania
Marie Osmundsen	Sunrise	Florida
Hob Osterlund	Honolulu	Hawaii
Aline Otero	Solebury	Pennsylvania
Angel Overgaard	Mosinee	Wisconsin
James Overstreet	Quincy	California
Dogan Ozkan	istanbul	Turkey
Letitia P Allman	Maple Shade	New Jersey
Aubrey P. Williams	Silver Spring	Maryland
Bernard P. Wojcik, Jr.	Otego	New York
Lorraine Pacheco	Millbrae	California
Patti Packer	Scotia	New York
April Pafford	Haiku	Hawaii

Name	City	State/Country
Carol Page	Somerville	Massachusetts
Devynne Pahio	Honokaa	Hawaii
Sarah Paige	Ojai	California
Paul Paine	Chiefland	Florida
Gregory Pais	Trout Run	Pennsylvania
Michelle Palacios Wimbish	Fairfax	Virginia
Bridget Palecek	Oshkosh	Wisconsin
Jan Paley	Los Angeles	California
Philip Palmer	Pasadena	California
Gina Palmer	Martins ferry	Ohio
Donna Panagakis	Mill Valley	California
Alyssa Panitch	Schenectady	New York
Kost Pankiwsykyj	Haleiwa	Hawaii
Sophie Panossian	Mahwah	New Jersey
Jennifer Papenberg	New Hartford	New York
Maria Papi	Los Angeles	California
Cynthia Papia	Millbury	Massachusetts
Julie Parisi Kirby	Woodstock	New York
Gram Parker	Streamwood	Illinois
Cindy Parker, MD	Baltimore	Maryland
Cheryl Parker	Rockland	Maine
Kathalene Parker	Monrovia	California
Noreen Parks	Keaau	Hawaii
Diana Partington	Wrightwood	California
Christi Paschen	Niles	Illinois
Richard Pasichnyk	Tempe	Arizona
avani patel	fontana	California
Name	City	State/Country
Christiane Patels	Lake Mary	Florida
Christine Paterson	Milton Keynes	Great Britain
Dianne Patterson	Sonoma	California
Diane Patton	Thousand Oaks	California
Santonu paul	cambridge	Massachusetts
Sean Paul	Cambridge	Massachusetts
Kim Paul	Coventry	Rhode Island
Lauren Paul	Houston	Texas
Richard Paul	Provo	Utah
Mark Paulino	Hamilton Square	New Jersey
John Payne	Bedford	Indiana
Tom Payne	Burlington	North Carolina
Nancy Pearlmutter	Malden	Massachusetts
Nancy Pearlmutter	Miami	Florida
Marcia Pearson	Shoreline	Washington
Vincent Pecchi	Santa Barbara	California
Tanja Pederson	Deer Park	Washington
Karl Peet	Billings	Montana
Debbie Peetz	Rio Linda	California
Kathy Pegg	Levittown	Pennsylvania
Mike Pelaez	Wilmington	Delaware
Tessa Peltier	Vero Beach	Florida
Eliza Pemberton	Raleigh	North Carolina
Susan Pepperwood	Ukiah	California
Bronwen Per-Lee	Arlington	Virginia
Josan Perales	Salem	Oregon
Rossi Peralta		Mexico
Michelle Pereira	Brasilia	Brazil
Richard Perez	Los Angeles	California
Michelle Perlman	Chicopee	Massachusetts
France Perlman	W Paris	Maine
Nathan Perry	Kensington	New Hampshire
Michael Pesa-Fallon	Brunswick	Maine
Claudia Petaccio	Haddonfield	New Jersey
Featherstone Peter	W. Midlands	United Kingdom
Andrew Peters	Skokie	Illinois
Nancy Petersen	Claremont	California
Heidi Peterson	Milwaukee	Wisconsin
GC Peterson	Fairfield	California
Kimberly Peterson	Cloverdale	California
George Petrisko	Maple Glen	Pennsylvania
carlton Phelps	lakeland	Florida
Patricia Phillips	Kent	Ohio
Kathleen Phillips	Wellington	Florida
Susan Phoenix	Bothell	Washington
Sherri Pickel	Ontario	California
Joseph Piecuch	Suquamish	Washington
Eric Piehl	Brighton	Michigan
Jay Pierce	Hazelton	Pennsylvania
Cassandra Pierson	Los Angeles	California
Kay Pierson-Jordan	Ann Arbor	Michigan
C. Piette	Tucson	Arizona
Susan Pilgrim	Central	South Carolina
Laura Pinedo	El Monte	California
Laura Pinnas	Tucson	Arizona
Lisa Pisanic	Germantown	Maryland
Francey Pisicoli	Calgary	Canada
Brent Pitts	Boise	Idaho
Desirie Pivnick	Parsippany	New Jersey
Scott Plantier	Pittsfield	Massachusetts
Kimberly Plastina	Oak Park	Illinois

Name	City	State/Country
Vanessa Plummer	Boulder Creek	California
Ellen Podolsky	Medford	Massachusetts
Lloyd Pohl	Banning	California
Michael Pollack	Cupertino	California
Bev Pollard	Richland	Michigan
Leigh Pomeroy	Mankato	Minnesota
Jackie Pomies	San Francisco	California
Michelle Ponitff	Marrero	Louisiana
Laura Pool	Mount Vernon	Ohio
Frank Porter	Souderton	Pennsylvania
Pat Porter	Yardley	Pennsylvania
Jane Porter	Wenham	Massachusetts
Jacquelyn Potter	Lansing	Michigan
Joel Potter	Houston	Texas
Judi Poulson	Fairmont	Minnesota
Deborah Powell	Pittsboro	North Carolina
Janet Powell	Pontiac	Michigan
Dawn Powell	Malverne	New York
Max Power	Everett	Washington
Wendy Powers	Santa Monica	California
Jenneffer Prajapati	San Jose	California
Kim Pratt	New York	New York
Sara Pratte	Springfield	Ohio
Melissa Preece	Jackson	Michigan
Nora Prentice	New York	New York
Randy Press	Austin	Texas
Yvonne Prete	Brookline	Massachusetts
Peter Price	Shadow Hills	California
Lucy Price	Norwich	United Kingdom
Walter Prim	Attica	New York
Heather Pristash	Beavercreek	Ohio
Melody Pritchard	Marion	North Carolina
Elizabeth Pritchard	Southlake	Texas
Matthew Proehl	San Francisco	California
Guy Prouty, Ph.D	Eugene	Oregon
Tamie Pryor	Naperville	Illinois
Robert Puca	New York	New York
Jennifer Pultz	Raleigh	North Carolina
Deidre Purcell	Troy	New York
Regina Purcell	Gardnerville	Nevada
Cathy Pyle	Widefield	Colorado
Harry Quade	Baltimore	Maryland
Lisa Quartararo	Colonia	New Jersey
Ew Quimbaya-Winship	Rochester	New York
Frederick Quinn IV	Mount Pleasant	South Carolina
Patricia R Hanks	Liberty	North Carolina
Paul R W Anthony	San Clemente	California
Tony Radford	Venice	California
Courtney Ragan	Whiteman AFB	Missouri
Shyla Raghav	Irvine	California
Mary Rahilly	Koloa	Hawaii
Sharghi Rahmanian	Knoxville	Tennessee
Jim Rahn	Santa Cruz	California
Amit Raikar	Sunnyvale	California
Jessica Rainey	Anderson	South Carolina
Jane Ralls	Minneapolis	Minnesota
R. Ralston	Concord	California
Braden Ramage	Portland	Oregon
Cristina Ramella Pezza	Torino	Italy
Mindy Ramey	Woodridge	New York
Carol Ramos	Ventura	California
Ellen Ramsdale	San Diego	California
David Randall	Port Jefferson	New York
D. Randall	E. Setauket	New York
Robert Rapice	Wolcott	Connecticut
Margaret Rasor	San antonio	Texas
Dick Ray	Citrus Heights	California
Jawanza Ray	Jackson	Mississippi
Pubali Ray Chaudhuri	Newark	California
Tristan Raymond	Ann Arbor	Michigan
Colleen Raynard	Saskatoon	Canada
Bob Razavi	Amherst	Massachusetts
Joe Razo	Santa Barbara	California
Frances Readdick	Jacksonville	Florida
Jerrina Reed	Anchorage	Alaska
Shannon Reed	Murfreesboro	Tennessee
Donna Reeve	North Potomac	Maryland
Sara Regan	Portland	Oregon
Bill Rehm	Carrboro	North Carolina
Russ Reid	Winchendon	Massachusetts
Mark Reif	Winchester	Virginia
Duncan Reilly	Reynella	Australia
Brice Reinhardt-Beltran	Seattle	Washington
Jennifer Reinish	Santa Barbara	California
Margaret Remington	Ridgway	Colorado
Edward Rengers	Woodstock	New York
Dr. Rev. Bryan Thompson	Lisle	Illinois
Angie Revallo	Harbor Springs	Michigan
Teresa Rex	South Jordan	Utah

Name	City	State/Country
Carrie Rex	Albuquerque	New Mexico
Jane Rexroat	West Chester	Ohio
Berta Rey	Dapto	Australia
Vanessa Rey Lovejoy	San Francisco	California
Fran Reyes	Los Banos	California
Patrick Reynolds	Lakewood	Washington
Brian Reynolds	Waco	Texas
Lone Rhodes	NYC	New York
Brandi Rice	O Fallon	Illinois
Beth Rich	Deckerville	Michigan
Loretta Richardson	Charlevoix	Michigan
Elaine Richardson	Ashtabula	Ohio
Sandra Richardson	Bloomington	Illinois
Margaret Richardson	White River Jct	Vermont
Heather Richman	santa cruz	California
Roxanne Rick	Milwaukee	Wisconsin
Stephanie Ricketts	Plover	Wisconsin
Linda Ricks	Beaufort	North Carolina
Mark Riddle	Morgan Hill	California
Maggie Ridge	New York	New York
Laurie Rieman	Robbinsville	North Carolina
Leslie Riley	Peterborough	Canada
Monica Riordan	Cincinnati	Ohio
Jesse Ritrovato	West Chester	Pennsylvania
Jennifer Rittenhouse	Minneapolis	Minnesota
Ginger Ritter	Phoenix	Arizona
Amy Ritter	Soquel	California
Diana Rivera	Piscataway	New York
Lauren Roan	Wichita	Kansas
H Roberts	Seaford	Delaware
Eden Robertson	New York	New York
John Robinson	Stone Mountain	Georgia
Keegan Robinson	Chula Vista	California
Misty Rockwell	Hagerstown	Maryland
Jodi Rodar	Springfield	Massachusetts
Jeffrey Rodrigues	Kailua-Kona	Hawaii
Lila Rogers	Hermosa Beach	California
Laura Romag	Spokane	Washington
Shawn Rorke-Davis	Phoenix	Arizona
Amy Rose	New Dehli	Delaware
Sundae Rosen	Bakersfield	California
Mary Rosenbeck	Jackson Center	Ohio
Sandra Rosenberg	San Jose	California
Julio Rosenblatt	Studio City	California
Heather Rosenfeld	N. Miami	Florida
Carrie Rosenthal	New York	New York
Jeremy Ross	LAWTON	Oklahoma
Kayla Ross	Athens	Ohio
Alexandra Ross	Geneseo	New York
Deanna Ross	Monterey	California
Regan Rostain	Lake Forest	California
Sandie Rotberg	Watertown	Massachusetts
barbara roth	las vegas	Nevada
Richard Roth	Chico	California
Robin Rotman	Lake Bluff	Illinois
Darryl Rotrock	Sykesville	Maryland
Jennifer Rowland	Middletown	Ohio
Jodi Rowley	Sydney	Australia
Jean Roy	Tucson	Arizona
Vickie Rozell	Redwood City	California
Shanna Rozelle	Frisco	Texas
Skye Rubin	Berkeley	California
Edward Rubino	Tempe	Arizona
Cheryl Rucks	Alameda	California
John Rudberg	Santa Fe	New Mexico
Milton Rudge	Whittier	California
Rob Rudloff	Lansdale	Pennsylvania
Gary Ruiz	Sonoma	California
Elisabeth Ruppel	Easton	Pennsylvania
Carrell Rush	Versailles	Kentucky
Jeni Rushing	Johnson City	Tennessee
Dorothy Russell	St Cloud	Minnesota
Jennifer Russell	Everett	Washington
Jack Russell	Winnetka	California
Rhiannon Russell	Franklinton	Louisiana
Robert Russell	Woking	United Kingdom
Christina Ruth	Chicago	Illinois
Eve Rutzick	Seattle	Washington
Name	City	State/Country
Bettie Ryan	Stillwater	Minnesota
Jon Ryk	Aurora	Illinois
M S Meyers	Upland	California
D. S. Crafts	Berkeley	California
Sandra Sabatini	Springfield	Massachusetts
Rita Sacks	Leesburg	Florida
N Sahar	Chula Vista	California
Melissa Saldana	Miami	Florida
Mary Salley	Vancouver	Canada
David Sals	Santa Cruz	California

Name	City	State/Country
Karen Salzgeber	Parma	Ohio
Jennifer Sanchez	Irvine	Texas
Ginger Sanders	Big Lake	Minnesota
Kristin Sands	Wylie	Texas
Josefina Sanfelio	Brooklyn	New York
Christopher Sanford	Hastings	Minnesota
Kathryn Santana	Los Angeles	California
Michael Santistevan	Phoenix	Arizona
Deborah Santone	San Ramon	California
Sam Santos	Louisville	Colorado
David Saperia	Santa Monica	California
Barry Sapp	McKinney	Texas
Soraja Sarasvati	Eden Prairie	Minnesota
Lloyd Sargent	Elgin	Texas
Darlene Sarver	Cincinnati	Ohio
Dawn Saunders	Patterson	New York
Alex Saunders	Danville	California
Edward Scoerbo	Peekskill	New York
Angela Schaab	Boulder	Colorado
Peggy Schaak	Dousman	Wisconsin
Sandra Schachat	Potomac	Maryland
Donna Schall	Stow	Ohio
Christina Schatmeyer	Countryside	Illinois
Arielle Schechter	Chapel Hill	North Carolina
Joseph Schembri	St. Pauls Bay	Malta
Marvin Scherl	Germantown	North Carolina
Brian Schick	Oakland	California
Eric Schinkel	Bristol	Connecticut
Evelyn Schira	Boca Raton	Florida
Hermann Schmid	San Carlos	California
Sara Schmidt	Cape Girardeau	Missouri
Cassie Schmitz	Fairfield	Iowa
Erik Schnabel	San Francisco	California
Chris Schneider Fenster	York	Nebraska
Thomas Schomogy	Maryland Hts	Missouri
Christopher Schroeder-Heiermann	Normal	Illinois
Jim Schuermann	Chicago	Illinois
Christine Schuetz	Cupertino	California
Vicky Schulman	Bethel Park	Pennsylvania
Vicky Schulman	Atherton	California
Peggy-Jo Schulte	Chicago	Illinois
Shelley Schultz	Lake Delton	Wisconsin
Jennifer Schwartz	Redondo Beach	California
Jeremy Schwartz	East Meadow	New York
Linda Schwarz	Santa Ana	California
Jason Schwarz	Menlo Park	California
Jonathan Schweiger	Apple Valley	California
Glenda Schweitzer	Manhattan	Kansas
Christopher Scott Brumfield	Baton Rouge	Louisiana
Galen Scott	Takoma Park	Maryland
Johanna Scott	Reseda	California
Niki Scott	Orange City	Florida
Lance Scott	Shaver Lake	California
M Sean Vennett	Tampa	Florida
christopher searles	brooklyn	New York
Amanda Sebrosky	Bay Village	Ohio
Dawn Seddon	Clearwater	Florida
Miki Seifert	Pasadena	California
Miyuki Seko	Fountain Valley	California
Dan Semler	Colton	Washington
Bob Semmler	Globe	Arizona
Laura Seraso	La Crescenta	California
Shelly Sernett	Duluth	Minnesota
Marla Serrine	Metamora	Illinois
BernaDette Session	Houston	Texas
Erika Sevetson	Madison	Wisconsin
Max Sezanne	Rome	Italy
Roberto Sgorbati	Milano	Italy
Amar Shah	Claremont	California
Ashley Shake	Louisville	Kentucky
Heather Shanks	Orient	Ohio
Zuriah Shara	Mt. Shasta	California
Deepti Sharma	Ypsilanti	Michigan
Charity Sharp	Jacksonville	Florida
Erika Shea	Waterloo	Canada
Johanna Sheinkin	New York	New York
aron sheivs	brooklyn	New York
Paul Sheldon	Sausalito	California
Barbara Shenton	NY	New York
Williamson Sherry	Mill Valley	California
Staci-lee Sherwood	Bloomington	New York
Arron Shevis	brooklyn	New York
Amy Shields	Birmingham	Alabama
Tamiko Shiery	Ontario	Oregon
Betty Shipley	Crystal River	Florida
Noelle Shipman	Portland	Oregon
Duane Short	Metropolis	Illinois
Lynn Shumway	Tempe	Arizona
Darice Shumway	Hastings	Michigan

Name	City	State/Country
Christiaan Siano	Austin	Texas
Ellen Siciliano	Des Plaines	Illinois
toni siegrist	Cambridge	Massachusetts
Ruth Siekevitz	New York	New York
Annette Sierak	West Palm Beach	Florida
Scott Sillett	Silver Spring	Maryland
Brilana Silva	Waianae	Hawaii
Lin Silvan & Family	Coeur d'Alene	Idaho
Tana Silverland	Mission Viejo	California
Seth Silverman	New York	New York
Barre Simmons	Springfield	Virginia
Klaus Simon	Frankfurt	Germany
John Simonian	South Bend	Indiana
Adrie Sims	Amherst	Massachusetts
Melanie Sinclair	Austin	Texas
Viriam Singh	Temecula	California
Diana Singleton	Glendale	California
Douglas Sitler	Rockledge	Florida
Paula Sjunneson	Seattle	Washington
Neal Skakel	Blairsville	Pennsylvania
Michelle Skinner	Panama City	Florida
Kate Skinner	Montreal	Canada
Jonathan sklar	Los Angeles	California
Shelly Skoog-Smith	Goleta	California
Kevin Slaboda	Burlingame	California
amy slack	minden	Louisiana
Stephen Sloane	Washington	District of Columbia
Christopher Smeglin	Quincy	Massachusetts
Sarah Smiley	Burbank	California
Deborah Smith	Oklahoma City	Oklahoma
Ben Smith	Brooklyn	New York
Joyce Smith	Momence	Illinois
Bill Smith	Prior Lake	Minnesota
Terrence Smith	Sugar Loaf	New York
Stephanie Smith	Arlington	Texas
Ryan Smith	St. Croix	Virgin Islands
Brandon Smithwood	Concord	Massachusetts
Jyllian Smolev	White Plains	New York
Larry Snyder	Drexel Hill	Pennsylvania
Marilee Snyder	Michigan City	Indiana
Sarah Snyder	Beaver Falls	Pennsylvania
Erica Solie	Garden Grove	California
Mitchell Solovay	Brooklyn	New York
Meghan Somerville	Orangeville	Canada
Daphne Somkin	Berkeley	California
Catherine Sommer	San Francisco	California
Jill Sonia	Dover	New Hampshire
Kathryn Sonnen	Washington	Pennsylvania
Donna Sonnenberg	Shawnee	Pennsylvania
Becky Sonstrom	Edgerton	Wisconsin
Michelle Sorensen	New York	New York
Linda Sotis	Hillsdale	New York
Joanna Soto-Aviles	Caguas	Puerto Rico
Sandee Sousa	Miami	Florida
Priscilla Sowa	Vernon	New Jersey
Rita Sowles	Kansas City	Missouri
Steve Spacek	San Marcos	Texas
Jane Spaeth & Steven Slagle, MD	New Braunfels	Texas
Nancy Spears	Bossier City	Louisiana
Jeremiah Spence	Austin	Texas
Pat Spencer	Alameda	California
Ellen Spencer	Brooklyn	New York
Jason Spiegel-Grote	Brooklyn	New York
Eric Spielman	Pleasant Plains	Illinois
Monica Spisar	Ann Arbor	Michigan
Kate Spooont	baltimore	Maryland
Richard Spotts	Bayport	New York
Patricia St. August	Okanogan	Washington
Bethany Staelens	Long Island City	New York
Karen Stamm	New York	New York
Kimberly Stamp	Albuquerque	New Mexico
Lynne Stanford	Canyonlake	Texas
Robert Stanton	Hoffman Estates	Illinois
Charles Stanyan	San Francisco	California
Dawn Stanzione	Barrington	Rhode Island
Betty Stapp	Los Alamitos	California
Day Starr	Phoenix	Arizona
Melissa Statman	Meadville	Pennsylvania
Karen Steele	Eureka	California
Brandi Steele	Lanett	Alabama
Joseph Stegner	Gainesville	Florida
Theresa Stehura	Glendale	California
Daniel Stehura	Glendale	California
Sandi Steidl	Albuquerque	New Mexico
Lora Steiner	Willits	California
Heather Steinmann	New Brighton	Minnesota
Dusty Stepanski	Richwood	New Jersey
Glen Stephens	Princeton	Illinois
Donald Stevens	winter park	Florida

Name	City	State/Country
Christine Stevens	Tacoma	Washington
Russell Stevens	New Boston	Texas
Candice Stevens	Silver Springs	Florida
jeanette stewart	falls church	Virginia
Nzingha Stewart	Brooklyn	New York
Velda Stewart	Ogden	Utah
Sharon Stewart	Rockledge	Florida
Alexa Stickel	miami	Florida
Theresa Stiith	Glenpool	Oklahoma
Denese Stokes	Big Bear City	California
B.E. Stoll	Tampa	Florida
Deborah Stone	Birmingham	Alabama
Sarah Stone	Camas	Washington
Shon Stone	Nicholasville	Kentucky
George Stone	Milwaukee	Wisconsin
Meredith Stone	Philadelphia	Pennsylvania
J Stover	Hill City	Kansas
Cyndi Stover	Paradise	California
Jessica Strick	Mt. Holly	New Jersey
Chris Striegel	Philadelphia	Pennsylvania
Eric Stromberg	Davis	California
Aimee Strouse	Sellerville	Pennsylvania
Andrianna Stuart	College Park	Maryland
Dr. Stuart&Judith Block	Bronx	New York
Harriet Stucke	Philadelphia	Pennsylvania
Mark Stuckenbruck	Livermore	California
Jeff Stutsman	Grand Rapids	Michigan
Denise Stutts	Upper Black Eddy	Pennsylvania
Kevin Suedmeyer	Columbia	Missouri
Dorothy Suggs	LaGrange	Georgia
Lawrence Sullivan	Belmont	Massachusetts
Paula Summers	Fair Oaks	California
Lawrence Sutton	Staten Island	New York
Jessica Swadosh	Southwick	Massachusetts
Jessica Swain	Turnersville	New Jersey
Linda Swanson-Davies	Portland	Oregon
Elizabeth Swartwood	La Mesa	California
Tony Swartz	Mesa	Arizona
Anne Swasey	Rochester	New York
Jemma Swatek	Greensboro	North Carolina

Name	City	State/Country
Mandy Swearingen	Mira Loma	California
Aileen Sweeney	Manhattan Beach	California
Karin Swelling	Albuquerque	New Mexico
Micci Swick	Winston Salem	North Carolina
Ann Swigart	Cincinnati	Ohio
Gail Swope	Crofton	Maryland
Gretchen Szostak	Montecito	California
Claudia T.	orangutans	Mexico
Deanna Tachna	Birmingham	Michigan
Semantha Tackett - Cox	Elizabethtown	Indiana
Carla Tam	New Haven	Indiana
Len Tamm	Albuquerque	New Mexico
Sarina Tanner	Sanford	Florida
Carole Tante	Mabelvale	Arkansas
heather taylor	jacksonville	North Carolina
Adrian Taylor	Chapel Hill	North Carolina
Julie Taylor	Greensboro	North Carolina
Ceres Taylor	Lacrosse	Wisconsin
Robert Taylor	Hillsborough	North Carolina
Laurn Taylor	San Mateo	California
Kim Taylor	Del Mar	California
Marijke Teirlinck	Somerset West	South Africa
Eddy Telemaque	Leicester	Massachusetts
P. Tellekamp	New London	Connecticut
Lisa Tener	Saunders town	Rhode Island
Theresa Terhark	Cottage Grove	Minnesota
DR. Terrance Hutchinsont	California City	California
Maria Therese	LIncolnwood	Illinois
Megan Thielking	Syracuse	New York
Thomas Thiss	Excelsior	Minnesota
Allen Thomas	fallbrook	California
John Thomas	Cecil	Pennsylvania
Ron Thompson	Cortlandt Manor	New York
Steven Thompson	Nashville	Tennessee
Elicia Thompson	Decatur	Georgia
Stephen Thompson	Kalaheo	Hawaii
Jane Thorngren	Ramona	California
Lauren Throop	Lander	Wyoming
Renee Tiesler	New York	New York
Peter Tiffany	Fallon	Nevada
Dawn Tiffin	Milwaukee	Wisconsin
Coby Tissington	Allderson	Oklahoma
Edward Todd	Roanoke	Virginia
Alexandra Toledo	Galt	California
Geri Tomat	Lyndhurst	New Jersey
April Tomikel	Corry	Pennsylvania
Mark Tomlinson	Cary	Illinois
Jean Tompkins-Welch	Ypsilanti	Michigan

Name	City	State/Country
Ann Toms	Spartanburg	South Carolina
Lisa Tonerelli	Freeport	New York
Jay Toney	Richmond	Indiana
Josep Tordera	Cambridge	Wisconsin
Sam Torello	Hudson	Florida
Jeff Tornheim	Walnut Creek	California
Robert Torricelli	Washington	District of Columbia
Kim Tostenson	Evansville	Minnesota
Keith Totherow	Conover	North Carolina
Susan Tower	Fairway	Kansas
Kayta Tracey	Taos	New Mexico
Jackie Travers	Greenlawn	New York
Laura Tregoning	Eureka	California
Cory Trembath	Troy	New York
Melissa Trent	Dayton	Ohio
Tia Triplett	Los Angeles	California
L.J. Triska	Honolulu	Hawaii
Alex Tsouvalas	Woburn	Massachusetts
Johnson Tsui	Staten Island	New York
Ron Tuason	Boulder	Colorado
George Tucker	Hollywood	Florida
Clare Tucker	Eugene	Oregon
Robert Tull	Medford	Oregon
Michael Tuma	San Diego	California
Andreas Turanski	New York	New York
Tina Turbeville	Nashville	Tennessee
Elizabeth Tures	Union	Illinois
Aaron Turkewitz	Chicago	Illinois
Samuel Turner	Santa Maria	California
Lorna Turner	San Bernardino	California
Jason Turner	Greenville	North Carolina
John Tyler	El Grenada	California
Charlene Ungstad	Sacramento	California
Cindy Unruh	San Leandro	California
David Uozumi	New York	New York
Carlos V. Climent	Miami	Florida
Matthijs Vader	Alphen aan den Rijn	Netherlands
Joshua Valencia	Hemet	California
Vivian Valentin	Santa Barbara	California
Andrea Valenzuela	benicia	California
Sophie Valke	Toulouse	France
Cheryl Vallone	Ashland	Massachusetts
Adrian Van Dellen	Woodville	Texas
Betty Van Wicklen	Waterviet	New York
Julia Van de Grift	Madison	Wisconsin
Andrea Van Liew	Williston	Vermont
Dona Van Bloemen	Santa Monica	California
Patricia Van Dyke	Belton	Texas
Daniel Van Luvender	Stanhope	New Jersey
Reba Vanderpool	Half Moon Bay	California
Nicole Vanderwyst	Vancouver	Canada
Willow VanLeenhoff	Leiden	Netherlands
Bobbie Vanover	Gallipolis	Ohio
Karen Varney	Oakland	California
Nancy Vasiloff	Somerville	Massachusetts
Dashielle Vawter	san diego	California
Milton Vega	Jacksonville	Florida
Alberto Vera	Roseville	California
Stephanie Verhulst	Menomonee falls	Wisconsin
Evelyn Verrill	Prescott	Arizona
Joeri Verschaeve	Jabbke	Belgium
Ijhan Verschuur	Omaha	Nebraska
Izzy Verschuur	Omaha	Nebraska
Claudia Vetesy	Boise	Idaho
Garth Vienneau	Lewis Lake	Canada
Cheryl Vigoda	Coconut Creek	Florida
Fernando Villegas	Santiago	Chile
Michele Villeneuve	Long Beach	California
R. Vincent Bradley	College Park	Maryland
Jaclyn Vinick	Arcata	California
Kay Virago	Seattle	Washington
Barbara Vitale	Long Beach	New York
Laura Vlk	Goleta	California
Susan Voll	Jamaica	New York
Beth Volpe	Brockton	Massachusetts
Robert von Tobel	Bellevue	Washington
Robert vonGiebel	Belvidere	New Jersey
Katie Vore	Ocoee	Florida
Demetria Vorters-Leggett	Atco	New Jersey
Barbara Voss	Woodland Hills	California
Jessie Vosti	Austin	Texas
Corina Wachter	Arcata	California
John Wade	Huntsville	Alabama
Mary Waff	Edenton	North Carolina
Leslie Wagner	Houston	Texas
Vickie Wagner	Three Oaks	Michigan
Stacey Wagner	Warren	Michigan
Linda Waiane	Taunton	Massachusetts
Donna Walcott	Port Huron	Michigan

Name	City	State/Country
Wanda Walczak	Huntington	West Virginia
Garry Walczewski	Rossford	Ohio
Jo Waldron	Everett	Washington
Charlotte Wales	Leslie	Arkansas
Katherine Walker	Hollywood	California
Matt Walker	Atlanta	Georgia
Lisa Wallace	Winston-Salem	North Carolina
Susie Wallace	Lincoln Park	Michigan
John Wallack	Fort Bragg	California
Julie Waller	Winter Park	Florida
Chris Wallraff	Los Angeles	California
Sarah Wallus	St. Louis	Missouri
Emily Walsh	Santa Barbara	California
Crystal Walter	Wichita	Kansas
Stacey Walter	Holbrook	Arizona
Kristin Walter	Sugar Land	Texas
Jen Walters	Louisville	Kentucky
Laura Waltrip	Winter Springs	Florida
Cong Wang	Mason	Ohio
Laura Ward	Los Angeles	California
John Wardell	Santa Clara	California
Stephanie Warner	Portsmouth	Ohio
Donna Warner	Coos Bay	Oregon
Matt Warnke	Santa Fe	New Mexico
Roxanne Warren	New York	New York
Jan Warren	Camden	Maine
Tom Warwick	Auburn	California
Meredith Waterloo	Dexter	Michigan
Catherine Waters	Baltimore	Maryland
Gary Waters	LAKE WALES	Florida
Alan Watson	Mims	Florida
Deborah Watson St. James	Martinsburg	West Virginia
Deira Watson	Bethesda	Maryland
Susan Watson	Orinda	California
Shaye Watson	Carrollton	Texas
Barb Watts	Louisville	Kentucky
Heath Watts	Missoula	Montana
Peter Waymire	San Francisco	California
Melissa Wayne	Philadelphia	Pennsylvania
Robin Weare	Long Beach	California
Jeffrey Weber	Sarasota	Florida
Diana Weber	Albany	New York
Paul Webster	Salt Lake	Utah
Jeanne Wehrhahn	Dixfield	Maine
Steve Weigner	Seattle	Washington
Stacey Weinberger	Oakland	California
Angela Weller	Clermont	Florida
Mark Wells	Des Moines	Iowa
Frances Werle	John's Island	South Carolina
Danielle Werner	Eugene	Oregon
Gretchen Wernersbach	St. Paul	Minnesota
Lisa-Marie West	Foster City	California
Marie Westhover	Deltona	Florida
Helene Whalen	Novi	Michigan
Barbara Wharton	La Jolla	California
Vickie Whitacre	York	Pennsylvania
Lois White	Grants Pass	Oregon
Susan White	Albuquerque	New Mexico
Tracey Whittington	Charleston	West Virginia
John Whitman	Wellesley	Massachusetts
Betty Whitmer	Vancouver	Washington
Kathy Whitmoyer	Bloomsburg	Pennsylvania
Beth Whitney	Sausalito	California
Cathie Whitt	Columbus	Ohio
Wendy Whitten	South Elgin	Illinois
Christie Whyland	Fort Lauderdale	Florida
Sandra Wiatrowski	High Springs	Florida
Jodie Wiederkehr	Chicago	Illinois
David Wigder	Bronx	New York
Gregory Wilcox	Candler	North Carolina
Shari Wildschutte	Concord	California
Catherine Wiley	Philadelphia	Pennsylvania
Paul Wilkins	Santa Fe	New Mexico
Konner Williams	Kingston	Colorado
Taffy Williams	Tuckahoe	New York
Fran Williams	Atlanta	Georgia
Stacie Williams	New Braunfels	Texas
Paul Williams	MOSINEE	Wisconsin
Patricia Williams	Boca Raton	Florida
David Williamson	Canton	Michigan
Seanna Willimas	Orem	Utah
Jen Willis	LA	California
Dana Willis	Winona	Minnesota
Kelly Willow	Mifflintown	Pennsylvania
Rita Wilson	Bethel Springs	Tennessee
Barbara Wilson	Great Neck	New York
Susan Winsberg	Los Angeles	California
Nancy Winters	Hermosa Beach	California
Ralph Wissing	Cincinnati	Ohio

Name	City	State/Country
Charley Wittman	Allentown	Pennsylvania
Richard Woerpel	Simi Valley	California
Name	City	State/Country
Stephen Wogan	Austin	Texas
Rachel Wolf	Santa Cruz	California
Robert Wolf	Naples	Florida
White Wolf Woman	Ripton	Vermont
Twyla Wolfe	Stoughton	Massachusetts
Margot Wolff	Zwolle	Netherlands
Ben Wollman	Racine	Wisconsin
Ken Wong	manhattan	New York
Simon Wood	Coffs Harbour	Australia
Erik Wood	New York	New York
Rachel Woodard	Ridgecrest	California
Trish Woodard	Shawnee	Oklahoma
Valerie Woodson	Buffalo Grove	Illinois
Megan Woodworth	Beverly	Kentucky
Lori Worcester	East Haven	Connecticut
Jeffrey Workman	Pittsburgh	Pennsylvania
Heather Wright	Milford	Michigan
Wendi Wright	Levittown	Pennsylvania
Michele Wright	New Castle	Delaware
Cathryn Wright	Stoughton	Wisconsin
Andy Wurl	Atlanta	Georgia
Candy Wurster	Franklin	North Carolina
Dorothy Wyatt	Newburgh	Indiana
Amanda Yaggy	Chapel Hill	North Carolina
Michelle Yakel	Turtle Creek	Pennsylvania
Steve Yakoban	Englewood	New Jersey
Naoko Yakota	Osaka	Japan
Mario Yanez	Miami	Florida
Natasha Yannacanedo	New York	New York
Cindy Yates	Wilmington	North Carolina
Delaine Yates	Los Angeles	California
Dafna Yee	Plano	Texas
Drew Yerkes	Shorewood	Wisconsin
Krystal Ying	Norwalk	California
Logan Yonavjak	Chapel Hill	North Carolina
Ana Yong Soler	El Paso	Texas
Emily Young	Ephrata	Pennsylvania
Pamela Young	San Diego	California
Carla Young	Lawrence	Kansas
Elaine Yu	Fremont	California
Peter Zadis	Walnut Creek	California
Jackie Zaferatos	Massepequa	New York
Kerri Zajicek	Hyattsville	Maryland
Ethan Zamonski	Glen Rock	New Jersey
Judith Zarin	Dolgeville	New York
Brook Zelcer	Westwood	New Jersey
Rose Zellers	Albuquerque	New Mexico
Raleigh Zellers	Albuquerque	New Mexico
Art Zernis	Rego Park	New York
Marian Zimmerman	Biddeford	Maine
James Zizzo	Wilmington	North Carolina
Ethan Zlomke	Madison	Wisconsin
Marilyn Zoratti	Palm Springs	Florida
Glen Zorn	Everett	Washington
Kelly Zurlein	Kearney	Nebraska

Appendix 6
**MARINE PROTECTED AREAS
AND POTENTIAL BENEFITS TO SELECTED SPECIES**

A Response to the California Fish and Game Commission



Prepared by the California Department of Fish & Game
Marine Region
September 1, 2002

Introduction

In a letter to the Department (dated January 1, 2002, attached), Commission President Mike Chrisman requested that the Department provide information on selected species and the projected benefits for each of those species that would result from their inclusion in Marine Protected Areas (MPAs). For the species listed below, the Department was asked to evaluate and describe a) the status of the population and, if known, the Department's best professional opinion as to whether the population is stable, increasing, or decreasing, and why it may require additional protections; b) the traditional fishery management measure enacted at the state and federal levels that have been implemented for the species, including all size and possession limits, quotas, optimum yields, trip limits, seasonal closures, gear restrictions, effort reductions or permit limitations, for both commercial and recreational fisheries, and why these measures are inadequate; and c) exactly what other benefits MPAs are expected to afford the species. Examples of MPAs in the state that have demonstrated effects (such as a larger population inside than outside the reserve) were also requested.

This information was requested for the following species:

1. Kelp and sand bass
2. Abalone
3. Black seabass
4. White seabass
5. Shelf rockfish
6. Nearshore rockfish
7. Sheephead, cabezon, greenling (kelp and rock)
8. Garibaldi
9. Sea urchins
10. Lobster
11. Corbina/surfperches
12. Crabs
13. Halibut
14. Ocean whitefish
15. Kelp

This report provides information in response to this request from the Commission. Where possible, the Department used information contained in the recently published "California's Living Marine Resources: A Status Report" (Leet et al. 2001), since this publication represents current information available on these species, including status, fishery related information, and in some cases, suitability for inclusion in marine reserves. Additional details requested by the Commission were added for each species as necessary and available. In addition to this report, the Environmental Document for the Channel Islands Marine Reserves process also details information about these and other species relative to their population status, fishery information, and benefits and costs associated with the establishment of marine protected areas, primarily marine reserves, in that area.

General Background on Marine Protected Areas

There is increasing evidence of a wide range of benefits associated within Marine Protected Areas (MPAs) including increased numbers of species (biodiversity), increased fish sizes, higher reproductive potential, and protection of stocks from sequential depletion. Although most studies show that the benefits occur primarily within the boundaries of the MPAs, several studies have demonstrated benefits to adjacent fished areas. While much of this evidence comes from tropical systems, many studies of reserves in temperate systems, similar to those in California, are available. The most compelling example of the benefits of a large no-take reserve comes from the closures on the Georges Bank and vicinity (Murawski et al. 2000). A closure designed to protect between 17 percent and 29 percent of the area occupied by cod, haddock, and yellowtail flounder was established following stock declines. The latest stock assessments indicate significant increases in spawning stock biomass, attributed to increased adult survival. The closed areas also protect young cod and haddock, as well as unfished species. An unexpected benefit was an increase in scallop abundance both within and nearby the closed areas, with associated increases in catch.

In a West Coast example, reproductive potential of copper rockfish was 55 times greater in a 27-year-old reserve in the Puget Sound than in nearby fished areas. This enhanced reproductive potential was attributed to greater densities and larger sizes of rockfish inside the reserve (Palsson 1998). Similar increases in size and density were seen in a very small reserve in the San Juan Islands compared to adjacent unprotected areas (Palsson and Pacunski 1995). In California, reproductive potential for black-and-yellow rockfish inside two small reserves in Monterey Bay was 2 times greater in one reserve and 10 times greater in the second, as compared to fished areas immediately outside the reserves (Paddock 1996). Even a relatively new reserve (the Big Creek State Marine Reserve, established in 1994) appears to have significantly greater size distributions of several economically important rockfishes (M. Yoklavich, R. Lea, and G. Cailliet, unpublished data).

Similar benefits are reported for species associated with natural refugia (areas that are protected by the nature of the environment, such as depth or inaccessibility) and other unintentional protected areas. Abalone populations are greater in water depths beyond the range of free divers in northern California (Tegner et al. 1992). Regulations prohibiting the use of SCUBA to take abalone in this area form a de-facto deep water reserve. High numbers of large rockfishes are locally associated with isolated rock outcrops in deep water submarine canyons that are less accessible to fishing (Yoklavich et al. 2000). Density, diversity, and size of economically valuable fishes have increased within two unfished areas near the Kennedy Space Center at Cape Canaveral, Florida compared to nearby fished areas, and tagging studies have demonstrated movement of fishes from the protected areas into fished areas (Bohnsack 1998; Johnson et al. 1999). In this same area, the number of recreational fishing records is significantly higher in the areas adjacent to the protected area than in the rest of Florida (Roberts et al. 2001).

MPAs may also provide benefits beyond their boundaries, such as exporting of larvae and “spillover” of adults to fishing areas, though there is less empirical evidence that shows this. The lack of evidence, however, is primarily due to the lack of research on this effect and the lack of appropriate MPAs that would be expected to show this effect. The example of increased numbers of record-size fish in areas adjacent to a protected area is one piece of evidence. Another example is shown in St. Lucia, a coral reef system, where nearly 35 percent of the fishing grounds were closed to all take in 1995. Within five years of creation, this network of five small reserves increased adjacent catches of artisanal fishermen by between 46 percent and 90 percent, depending on the type of gear used (Roberts et al. 2001).

A major benefit afforded to fisheries management through the use of MPAs is insurance against uncertainty. Many State managed populations are considered to be in what are called “data poor situations”, with little information available on population size, population status, life history, and the magnitude of fishing mortality. This lack of information on basic life history and population status could lead to incorrect assumptions when making management decisions. Establishing MPAs that protect a portion of these populations could offer a buffer against uncertainties due to natural environmental fluctuations or the limited availability of biological information. MPAs are also useful areas to perform studies on basic life history or organisms and as comparison sites to determine the difference between natural and human-caused effects on marine populations.

The insurance provided by protecting a portion of populations within MPAs could help sustain local marine populations and provide a reproductive source to assist with rebuilding depleted stocks. By reducing mortality rates within MPAs, the average density, size, and age of previously fished species may increase. For many species, larger organisms are known to produce significantly more young, because the number of eggs the number of eggs produced by an individual increases dramatically with size. Populations with relatively sedentary adults will be more likely to benefit from MPA protection. Production outside an MPA will be due primarily or in larger part to larval export. In contrast, the density, size, age, and fecundity of relatively mobile species within an MPA will likely increase less compared with a sedentary species because of their movement in and outside MPA boundaries.

Environmental fluctuations play a large role in affecting the reproductive success of many marine species. These natural fluctuations affect the ability of a stock to sustain exploitation. A network of MPAs could provide a buffer against sporadic reproductive success of many species due to environmental fluctuations. The protected portion of stocks might help sustain populations in years of poor reproductive success.

The following table summarizes potential expected benefits to populations that could be gained from a network of MPAs, based on the life history parameters of the species listed below (e.g. growth rates, reproductive strategies, life span, home range, etc.). To gain the fullest range of potential expected benefits, the network of MPAs would need to encompass a representative portion of a species habitat as well as a significant portion of a species lifecycle within individual MPA boundaries.

Table 1. Potential benefits of MPAs for a variety of species.

Potential Benefits	Habitat / Ecosystem Protection ¹	Insurance against Uncertainty ²	Fisheries Benefits ³	Protection when Aggregated ⁴	Assist with Recovery ⁵
Kelp bass	X				
Barred sand bass	X			X	
Abalone	X	X	X	X	X
Giant sea bass	X	X		X	X
White seabass	X			X	
Nearshore rockfishes	X	X	X	X	X
Shelf rockfishes	X	X	X	X	X
Sheephead	X	X			
Cabezon and greenlings	X	X	X	X	
Garibaldi	X				
Sea urchins	X	X		X	
Lobster	X				
California corbina	X				
Surfperches	X	X	X	X	
Crabs	X		X		
California halibut	X			X	
Ocean whitefish	X				
Kelp	X				

¹ Critical habitats are protected in MPAs. These habitats may play an important role in various life history stages, from settling to adult. By protecting habitat, ecological interactions with other species are allowed (ecosystem protection). Might be more important for a sedentary species or for a particular life stage of an individual species.

² MPAs may protect a portion of residential stocks from accidental overfishing and uncertainty inherent in fisheries management, especially in fisheries that are data poor. By protecting a portion of a stock from any take, at least that portion may be sustained over time. This would provide for long term availability of adults, protecting against sporadic reproductive success (common among many marine organisms) as well as insurance for uncertain population estimates. Transient stocks could also gain intermittent protection throughout State waters via a network. Garibaldi are currently protected from all take; they are very residential and appear to fully occupy their expected range. MPAs likely would not offer much protection for lobster populations

since adults in California apparently are not the source of much spawning success here.

³ Fisheries benefits outside MPAs may occur through larval export or adult migration. Based on knowledge of life history, it is expected that some species will migrate out of MPAs (spillover) or be actively transported out as larvae. Either of these occurrences could benefit populations and therefore fisheries outside MPA boundaries.

⁴ MPAs may protect spawning, nursery, and aggregation areas. Protection during these critical periods provides significant benefit through increased success in recruitment and spawning. This protection includes times when individuals are guarding nests.

⁵ MPAs may aid in the recovery of over-exploited populations. Certain species require minimum densities in order to successfully reproduce. These densities are more likely to be reached in MPAs than in areas where some limited take or even bycatch occurs. In addition, increases in reproductive success described above could help support recovery.

Kelp (Calico) Bass (*Paralabrax clathratus*)

Status of the Population:

Kelp bass are taken only by sport anglers. Since the 1960's, the catch has fluctuated greatly. In the 1970s and 1980s, the kelp bass was among the top three species taken by the average angler per hour of fishing (along with barred sand bass and Pacific mackerel) (Oliphant et al. 1990). In 1986 and 1989, kelp bass were the most commonly taken species in the Commercial Passenger Fishing Vessel (CPFV) fleet. Throughout the 1980s, kelp bass have consistently ranked among the top five fishes caught by CPFV anglers (Oliphant et al. 1990). Department surveys indicate the estimated total catches of kelp bass have increased since the mid-1970s. Low periods of kelp bass landings in the mid-1970s and early-1980s may be attributed to El Niño events that provide anglers with alternative species to catch. Peak landings have followed each El Niño event. Department surveys of the CPFV industry in the 1970s and 1980s indicated a stable spawning population was being maintained because of the large number of age classes that are caught and kept by anglers (Ally et al. 1991). The recent Federal Marine Recreational Fishery Statistics Survey estimated that since 1990 the catch from shore, pier, and private boat anglers averages about 900,000 kelp bass per year which exceeds that of CPFV fishermen (about 800,000 fish per year). The CPFV landings of kelp bass fluctuated, with a general declining trend from 1993 to 1999. In 2000 and 2001 landings rebounded to previous levels. While this is not a direct measure of abundance, catches trends offer some insight into the overall health of a stock. Kelp bass stocks are believed to be stable. The current regulations appear to be maintaining adequate recruitment. However, heavy fishing pressure results in few fish surviving beyond the 12 inch size limit, such that "trophy" sized fish are rare in most areas.

Home Range/Migratory Patterns:

Kelp bass have ranged historically as far north as the mouth of the Columbia River and south to Bahia Magdalena, Baja California. However, they are rare north of Point Conception. They are abundant in southern California waters including all the Channel Islands. They are typically found in shallow water to 150 feet, and are closely associated with high relief structure, including kelp beds. Recent studies have shown that some kelp bass may move in excess of 50 miles (Love et al. 1996).

Current Regulations:

No commercial take allowed.

Recreational minimum size limit is 12" total length, Possession limit is 10 in combination of kelp bass, barred sand bass and spotted sand bass.

Current regulations appear generally effective in maintaining a stable population.

How MPAs May Help:

The kelp bass is a top predator in the nearshore reef/kelp community. The effect of removing larger individuals from this nearshore ecosystem is not fully understood, but is likely significant. The abundances and balance of other species in this system might change in ways we cannot presently predict with any certainty. Since such reserves would protect other exploited species as well, the ecosystem functions of kelp bass might be altered as a result of more intense competition and predator/prey interactions. Similarly, reserves would also protect habitats valuable to kelp bass from a variety of potential fishing activity related impacts.

Studies on kelp bass in existing small MPAs at Catalina and Anacapa Islands, and La Jolla have shown that size and abundance of kelp bass are higher inside the reserves than outside (Beers and Ambrose In Prep). It can be anticipated that relatively large reserves will allow for an increase in numbers and sizes of kelp bass within the reserves.

Relatively large sized reserves can act to assure the continuing health of the kelp bass population if changes in exploitation levels occur, or if unforeseen environmental fluctuations result in a significant decline and sustainability of stocks. This insurance scenario would require that some significant portion of the stock is placed under reserve protection.

It would be expected that large MPAs would protect populations of large adult kelp bass that have significantly higher reproductive potential than smaller individuals. However, since there does not appear to be a deficit in recruitment potential under present management, any potential benefit through increased larval reproduction might be outweighed by the loss to the fishery from closing large areas of fishing grounds.

Studies have indicated that kelp bass may travel as far as 50 miles. This would suggest that while a large reserve would be needed to protect all members of an intact population, some portion of the population might be expected to occasionally move outside the reserve, providing added kelp bass to the fishery in adjacent areas.

Barred Sand Bass (*Paralabrax nebulifer*)

Status of the Population:

Barred sand bass are targeted exclusively by sport anglers; the commercial take of this species, like kelp bass has been illegal since 1953. Throughout the 1930s and early 1940s, sand bass, as well as kelp bass, were not considered to be quality angling fare but gained tremendously in popularity as game fishes by the mid-1950s (Leet et al. 2001). At that time, concern about the resource by sport fishermen and fishery managers resulted in the initiation of life history studies and the formulation of conservation measures. By 1959, a 10-fish bag limit and a 12-inch minimum size limit had been imposed on all three kelp and sand bass species; these measures were designed to counteract the declining numbers and shrinking size composition of the bass catches.

In 1985, 1987 and 1988, barred sand bass was the leading bass species in the CPFV catch, exceeding kelp bass landings for the first time since 1961 when kelp bass and sand bass landings were first reported separately (Leet et al. 2001). Beginning in 1994, and continuing through 2000, reported CPFV catches of barred sand bass have far exceeded kelp bass. Over 736,000 fish were taken during 2000, the all-time annual high catch for a bass species taken on CPFVs. Estimates of annual barred sand bass landings from the Marine Recreational Fisheries Statistics Survey (MRFSS) for all sport fishing activities (shore, pier, private boat, CPFVs, etc.) ranged as high as 1,940,000 in 1988 (Leet et al. 2001). Data from the MRFSS shows landings of barred sand bass in all modes during the 1990s were about 40 percent lower (30 percent lower for CPFVs) than those in the 1980s (Leet et al. 2001). Paradoxically, the Department's CPFV logs show a 40 percent increase in barred sand bass landings during the same period. Since the statistical way in which field samples are drawn in the MRFSS is based on previous years effort estimates, this survey may miss or over sample fisheries, as was probably the case in the 1980s and 1990s. CPFV data presents a more accurate picture of changes in the barred sand bass fishery since it represents a census of all vessels reporting and is not based on previous year's behavior.

Home Range/Migratory Patterns:

Although nothing is known about home range or migration patterns, tagging studies have shown barred sand bass are capable of movements of 5 to 40 miles. Anecdotal evidence suggests barred sand bass may occur in discreet groups which move up and down the coast as the water warms and cools.

Current Regulations:

No commercial take is allowed.

Recreational size limit is 12" total length

Possession limit is 10 in combination with kelp bass and spotted sand bass.

Current regulations generally appear effective in maintaining the barred sand bass population. Biological data collected from the MRFSS for the past 9 years shows the average weight has varied from 1.3 pounds to 2.0 pounds, with an average for the last 5 years of 1.5 pounds. The same data set shows the mode (the most frequently caught size fish) in length frequency distributions for 1993 through 1999 versus 2000 and 2001 has actually shifted to fish 1 inch larger (13 in. vs. 14 in.). Given that barred sand bass are managed on a yield-per-recruit basis, the current regulations are adequately protecting the resource.

How MPAs May Help:

Barred sand bass tend to aggregate on inshore sandy bottom areas during spawning events, where they also become vulnerable to the heaviest fishing pressure. Using reserves as a management tool would be effective by setting aside large sandy bottom areas along the coast as harvest refugia. Generally speaking, these sandy bottom areas have not been considered high priority areas to protect, as species biodiversity and overall fish densities tend to be low compared with reef areas. Other than the protection of spawning aggregations, traditional fishery management tools (size limits, bag limits, and seasonal closures) appear to offer more protection for barred sand bass than MPAs.

Abalone

Seven species of abalones are found in California. Abalones attach with a large foot to rocky substrate, and feed primarily on drift algae. Five species of abalones (black, green, pink, red, and white) were popular sport and commercial species until southern California populations experienced severe declines during the 1960s, 1970s, 1980s and 1990s. A valuable red abalone recreational fishery still remains in northern California. These declines likely resulted from a combination of overharvest, disease, and a long-term warming trend leading to poor recruitment coincident with enhanced storm activity, reduced kelp abundance, and increased competition with sea urchins (Leet et al. 1992; Engle 1994). One species, the white abalone, has been listed as endangered under the general Endangered Species Act (ESA) and another, the black abalone, is a candidate species for such listing.

Black abalone (*Haliotis cracherodii*)

Status of the Population:

Black abalone populations in southern California have suffered catastrophic declines since the mid-1980s that have resulted in a nearly complete disappearance of black abalone along mainland shores south of Point Conception (Miller and Lawrence-Miller 1993), as well as at many of the Channel Islands (Lafferty and Kuris 1993; Richards and Davis 1993). Mortality was associated with "withering syndrome" (WS), in which the foot shrinks and weakened individuals lose their grip on rock surfaces (Antonio et al. 2000; Friedman et al. 1997; Gardner et al., 1995). Withering syndrome has been observed in abalone north of Point Conception in recent years; however the disease is not widespread (Altstatt et al. 1996). Because of low recruitment, slow growth, and already reduced reproductive populations, black abalone are currently proposed for Federal listing under the ESA.

Green abalone (*Haliotis fulgens*)

Status of the Population:

Green abalone supported an important fishery in California, with landings peaking in 1971 and rapidly declining thereafter (Leet et al. 1992). They were most common along the far southern mainland coast and at the southern Channel Islands, and were present at the northern Channel Islands, but are now rarely encountered. The green abalone commercial and sport fisheries are currently closed. Populations appear to be extremely low.

Pink abalone (*Haliotis corrugata*)

Status of the Population:

In the early 1950s, pink abalone comprised the largest segment (about 75 percent) of the abalone fishery and were a significant component of the total abalone landings. Commercial landings originated at the eastern northern Channel Islands (Anacapa and Santa Cruz), and the southern Channel Islands (San Nicolas, Catalina Island, Santa Barbara, and San Clemente). Because pink abalone are more fragile than other abalone and grow more slowly, the level of take could not continue (Leet et al. 2001). On Department research cruises to San Clemente, Catalina Island, and Santa Barbara Islands in 1996 and 1997, the number of abalones sighted per unit of time was used to quantify stocks, and a factor was applied to estimate the number of commercially legal pink abalone that could be collected per hour. Estimates ranged from about one to 1.5 abalone per hour (Leet et al. 2001). Similar cruises conducted in 1999 estimated only 0.28 commercially legal pink abalone per hour (Leet et al. 2001). At Catalina Island, no commercial-sized pink abalone were found (Leet et al. 2001).

Red abalone (*Haliotis rufescens*)

Status of the Population:

Red abalone was previously an important fishery in California, with landings peaking in 1967 and steadily declining thereafter (Leet et al. 1992). In central and southern California, red abalone had declined the least of all five species by the time the fishery was closed in 1997 (Leet et al. 2001). Combined landings of red abalone declined during the period from 1969 to 1982 stabilizing at 1/10 their historic average during the 14-year period before the 1997 closure (Leet et al. 2001). Detailed examination of catch by area and fishery independent assessments revealed that the stability in landings masked ongoing reductions of local populations, as successive areas declined by over two orders of magnitude. From 1952 to 1968 most red abalone were caught in central California, followed by southern mainland, Santa Cruz, Santa Rosa and San Miguel Islands (Leet et al. 2001). Catches declined first along the central coast under the combined effects of expanding sea otters and fishing pressure. Outside the sea otter range catches declined more slowly along the southern mainland than at Santa Rosa, Santa Cruz, and San Nicolas Islands. From 1983 to 1996, catches decreased off these three islands to three percent for Santa Rosa and less than one percent for Santa Cruz and San Nicolas, of their respective peak catches by the 1997 closure (Leet et al. 2001). San Miguel Island and the north coast were the exceptions to this pattern. Catches from San Miguel Island, the farthest and most northern of the Channel Islands, and the north coast comprised 71 of the 87 tons landed in 1996 prior to the fishery closure in 1997 (Leet et al. 2001).

A successful red abalone sport-only fishery continues to the north of San Francisco County, where SCUBA has always been prohibited and commercial take was only allowed for a three year period during World War II. Beginning in the 1960s, breath

hold diving effort has increased in relation to shore picking (Leet et al. 2001). In 1960, an estimated 11,000 diver-days were expended to take 118,000 pounds of red and black abalone, compared with 29,000 diver-days to take 192,000 pounds in 1972 (Leet et al. 2001). By 1985 to 1989, average diver-days and shore picker-days per year were focused on red abalone in central and northern California. Estimated landings of red abalone in central and northern California for combined divers and shore pickers reached a high of 3,472,000 pounds in 1986 and had decreased to 1,161,000 pounds by 1989 (Leet et al. 2001). In 1998 an abalone stamp was first sold to generate revenues for stock assessments. In 1998 and 1999 an average 33,000 stamps were sold showing effort levels are comparable to those estimated for the 1985 to 1989 period (Leet et al. 2001).

White abalone (*Haliotis sorenseni*)

Status of the Population:

The white abalone fishery developed late due to their deep habitats, with the first reported commercial landings in 1968. However, this species was popular for their tender meat. Abundances were highest at the southern and northeastern Channel Islands. Peak landings occurred in 1972 and decreased thereafter (Leet et al. 1992). Average density during periods of peak take in the 1970s was one abalone per square meter. Density has dramatically decreased since to 0.002 per square meter (Carlton et al. 1999). Surveys in the Channel Islands area found that density may have further decreased to 0.0001 per square meter (Davis et al. 1998). Since females must be within a few meters of a male during spawning for fertilization to occur, present population densities in the area may preclude successful spawning. The entire white abalone fishery has been closed since 1993, though densities have continued to fall (Carlton et al. 1999; Davis et al. 1998). Sub-threshold breeding density and continued predation (by fish, octopus, sea stars and other species) suggest that recovery without significant human intervention is unlikely. Submersible surveys were carried out to further evaluate population status and to explore possibilities for collection of specimens for a captive breeding program. The rarity of this species prompted the National Marine Fisheries Service (NMFS) to list it as a candidate species under the federal ESA in 1997. This action required a status review, which concluded that overexploitation was the major cause of the decline. Subsequently, in May 2001 the white abalone became the first marine invertebrate to receive Federal protection as an endangered species.

All Abalone Species

Home Range/Migratory Patterns:

All abalones are benthic rock dwellers, moving relatively short distances throughout their lives. Some species may migrate from deep to shallow depths in search for food. Others may spend years on the same home location. Each species of abalone has a different depth and latitudinal distribution. Three species (red, black, and pinto) occur

throughout California. Pink, green, and white abalone occur in southern California and into Mexico. Flat abalone occur from central California northward. The depth distributions are: black, high intertidal; red, intertidal to 80 feet; green, subtidal to about 20 feet; pink, subtidal to 120 feet, white, subtidal to depth of 200 feet; flat sub tidal to 70 feet, and pinto, subtidal to 70 feet.

Current Regulations:

No commercial take is allowed.

Recreational take is prohibited south of a line drawn due west from the center of the mouth of San Francisco Bay. Only red abalone may be taken north of that line. Red abalone must be seven inches or greater along the longest shell diameter. No more than three red abalone may be possessed at any time and no more than 24 may be taken in any calendar year. No scuba or surface-supplied air may be used in taking abalone.

How MPAs May Help:

There is empirical evidence that the establishment of marine reserves benefits fished invertebrates such as abalones (Dugan and Davis, 1993). It is clear that populations protected from fishing will achieve larger sizes, live longer, and produce more offspring over their lifetime than counterparts in fished areas. Size is critical for abalone reproduction and the largest abalone have many more (4-8 times) eggs than intermediate size animals (Tegner 1989). Increased densities observed in protected areas are important for reproductive success. Abalones that are close together have an 80 percent chance of successful fertilization, but this value rapidly declines if individuals are farther apart. Abalone farther than 4 meters from their nearest neighbor have little chance of successful fertilization because of dilution of the eggs and sperms (Babcock and Keesing 1999).

Abalone stocks that have produced sustained yields over time have been ones in which a part of the population was protected, either in actual or de facto reserves where fishermen did not have access to the resources (Karpov et al. 1998, Walters and McGuire 1996). In California, pink abalone inside the Anacapa Island reserve at Landing Cove were larger in size and as a consequence had increased spawning potential, compared with a fished site (Admiral's Reef) and an unprotected reserve (Cathedral Cove) (Rogers-Bennett et al. In press).

Pinto abalone (*H. kamtschatkana*) inside a reserve in British Columbia had larger individuals (greater than 130 millimeters) and higher abundances compared with unprotected closed areas (Wallace 1999). Despite the total closure of the abalone fishery in British Columbia enacted in 1990, only the closed area neighboring a prison with a 24-hour armed guard had more and larger abalone, suggesting widespread illegal fishing (Wallace 1999). Likewise, the potential reproductive output, estimated by multiplying the number of abalone by the mean fecundity of the site, was also greatest

in the heavily protected closed area. Abalone populations in British Columbia have not rebounded despite the fishery closure suggesting the need for restoration (Campbell 2000) and better compliance with the provincial closure.

Abalone have provided some of the best examples of how important interactions between members of the marine community may be facilitated by no-take reserves. Researchers have determined a link between the presence of adult red sea urchins and juvenile abalone. Juvenile abalone find shelter under the spines of adult sea urchins and use this as protection from predation and wave shear. More juvenile red and the rare flat abalone were found inside red sea urchin reserves compared to areas where red sea urchins had been fished in northern California (Rogers-Bennett and Pearse 2001). This interaction was first described in central and southern California red abalone (Tegner and Dayton 1977). Similar results have been found in Japan (Kojima 1981) and South Africa (Day and Branch 2002). In South Africa, experimental removals of sea urchins dramatically decreased local densities of juvenile abalone (Day 1998).

It has been suggested that just the moratorium on the take of abalones south of San Francisco Bay alone is sufficient to lead to recovery of California abalone resources because now most of California is an "abalone reserve". The closure is a first step toward recovery, but it has not brought individuals closer together to facilitate reproduction and it has not provided any actual increased protection to the remaining stocks. The southern California abalone closure, established in 1977, prohibited abalone take along parts of the Los Angeles and Orange County coasts, but was not successful in recovering stocks (Tegner 1993). It was too far from existing stocks for recolonization to take place and did not afford sufficient protection from poaching to be effective.

Additionally, for high value species like abalone that need aggregations of adults to successfully recruit, protection is facilitated by establishment of no-take reserves. In such areas there is no question about whether a species is allowed to be taken, and possession of any species is a violation. Such protected areas will be necessary before aggregating of the remaining stocks, and translocations operations can be conducted.

Giant Sea Bass (*Stereolepis gigas*)

Status of the Population:

In 1981, a law was passed that prohibited the take of giant sea bass for any purpose, with the exception that commercial fishermen could retain and sell two fish per trip if caught incidentally in a gillnet or trammel net. This law also limited the amount of giant sea bass that could be taken in Mexican waters and landed in California. A vessel could land up to 1,000 pounds of Mexican giant sea bass per trip but could not land more than 3,000 pounds in a calendar year. The law was amended in 1988, reducing the incidental take to one fish in California waters. Although this law may have prevented commercial fishermen from selling giant sea bass in California, it did not prohibit fishing over habitats occupied by this species and probably did little to reduce the incidental mortality of giant sea bass, as giant sea bass that were entangled in the nets were discarded at sea. The 1981 rule changes were more effective in protecting giant sea bass in Mexico, since large landings had been historically made by hook-and-line fishermen targeting grouper, cabrilla, and giant sea bass off the Pacific coast of Baja California. Since the banning of inshore gillnets displaced the California fishery from the majority of areas inhabited by giant sea bass, it is reasonable to assume that this closure significantly reduced the incidental mortality of giant sea bass in California. Even so, given the slow growth and reproduction of the species, the California population of giant sea bass remains below historical highs. Anecdotal information suggests that numbers may be beginning to rebound under current measures (Leet et al. 2001). No hard data exist that provide actual or relative numbers of giant sea bass (Leet et al. 2001).

Home Range/Migratory Patterns:

Little is known about the home range of giant sea bass and even less is known about migratory patterns. We do know that giant sea bass aggregate at specific sites early in the summer and disperse in the fall. This is thought to be associated with spawning but fish taken during this period usually display little evidence of spawning. Where fish disperse to after leaving the aggregating areas is unknown. It is unusual to catch an adult giant sea bass when they are not aggregated together.

Current Regulations:

Giant sea bass may not be taken commercially, except that not more than one fish per vessel may be possessed or sold if taken incidentally by gill or trammel net.

Giant sea bass may not be taken by recreational anglers. Incidentally taken fish must be immediately returned to the water.

While these regulations prohibit directed take, they do not prevent incidental take. Giant sea bass inhabit areas where many popular sport and commercial species are taken and are prone to incidental take. While numbers may be increasing, this also

increases the risk of incidental take. Aggregations of giant sea bass can be severely impacted by such interactions. These large fish tend to experience overexpansion trauma to their gas bladder when brought to the surface and are difficult for most recreational anglers to release unharmed.

How MPAs May Help:

Reserves in appropriate locations could protect spawning aggregations of giant sea bass. Recent incidents of illegal take by spearfishermen have been documented at both Anacapa and Catalina Islands. These incidents show that though this is already a protected species, take could be further prevented in totally protected MPAs. MPAs would also eliminate the potentially harmful incidental take by hook and line and net gears. They would offer little or no protection to fish when they are not aggregated since they would leave the area protected by the MPA.

White Seabass (*Atractoscion nobilis*)

Status of the Population:

White seabass population estimates have not been made (Leet et al. 2001). Fishery biologists have been concerned about the decline in landings since the late 1920s. Human-induced changes, such as pollution, overfishing, and habitat destruction, have probably contributed to this long-term population decline (Leet et al. 2001). However, natural environmental changes can also influence the population. The large numbers of small white seabass caught in recent years suggests that the warm water period beginning with the 1982-1983 El Niño helped to increase young fish survival (Leet et al. 2001).

There are indications that the white seabass population off California is recovering from low levels seen in the 1970s, 1980s, and most of the 1990s. Recent landings by sport and commercial fishermen have increased substantially and are approaching levels seen in the late 1940s and early 1950s; total landings for 2000 and 2001 each approached 1,000,000 pounds. In addition, recruitment of white seabass has increased significantly in the Southern California Bight in recent years. Young fish surveys conducted in southern California, as part of the Ocean Resources Enhancement and Hatchery Program (OREHP), showed a dramatic increase in the number of fish taken in research gillnet sets. During research work in 1997, over 600 juvenile fish were captured; in 1998 approximately 700 fish were taken, and in 1999 slightly over 1,300 juveniles were captured (Leet et al. 2001). The final OREHP sampling report for 2000-2001 showed 1,845 juvenile fish were captured during calendar year 2000, continuing the dramatic increase in juvenile white seabass. Anecdotal evidence from commercial and sport fishers also confirms this dramatic increase in juvenile white seabass. It is unknown whether this increase in juveniles will continue to enhance the adult spawning population (Leet et al. 2001).

Home Range/Migratory Patterns:

Nothing is known about the home range of white seabass. Information obtained from OREHP tagged and released juvenile fish shows that the fish are capable of moving at least 70 miles along the coast in a year. Releases of fish at Catalina Island and subsequent recoveries along the coast show they will move between the islands and the coast. The recent recovery at Catalina Island of a wild fish tagged along the coast shows movement is also possible offshore. Based on tag recoveries, it is apparent white seabass move considerable distances and this is probably the norm.

Current Regulations:

The Commission recently adopted and certified the White Seabass Fishery Management Plan (WSFMP) and adopted White Seabass implementing regulations, which became effective August 30, 2002. These implementing regulations include several new provisions intended to ensure sustainable management of white seabass

stocks off California. The WSFMP and regulations provide for an annual assessment and review process that involves both Department fisheries managers and scientific and industry advisors working together to fashion management recommendations for consideration by the Commission. The WSFMP provides a framework approach to management that enables the Commission to make quick adjustments to management measures if needed. The WSFMP also sets a total harvest limit (sport and commercial) of 1.2 million pounds to help ensure stocks are managed at sustainable levels and lists several trigger mechanisms aimed at identifying when overfishing of the white seabass stock occurs. Implementation of the WSFMP does not change regulations for white seabass that are currently in place.

Under current regulations, it is unlawful to commercially take white seabass between March 15th and June 15th south of Point Conception. Commercially taken white seabass must be at least 28 inches long. Gill net vessels are allowed to land one fish per day if taken incidentally during the closed season, and gill net mesh size must be a minimum of 6 inches in length.

The recreational size limit is also 28 inches total length. Three fish may be taken except that only one fish may be taken between March 15th and June 15th south of Pt. Conception.

Current regulations, along with augmentation of white seabass from OREHP, appear to be adequately protecting white seabass, especially when ocean conditions are appropriate for successful reproduction. The seasonal commercial closure and recreational limit reduction attempts to protect spawning fish. It has been noted, however, that many undersized fish are incidentally killed when released in the recreational fishery, and that “high-grading” (continuing to fish once a limit is reached in order to get larger fish) may also occur. This practice appears to be declining substantially on CPFVs due to peer pressure to avoid waste. Private boat anglers also appear to be less inclined to continue fishing after a limit is reached.

The recently adopted WSFMP will also protect white seabass stocks. However, the WSFMP cautions that more data and a formal stock assessment are needed to yield a more accurate harvest limit and a better defined harvest control rule. The Commission will review the WSFMP annually.

How MPAs May Help:

It could be expected that MPAs might protect populations of white seabass in areas which may be habitat identified as ideal for enhancing other populations of marine fin fish. It has been suggested that white seabass spawn around rocky nearshore areas or near kelp beds (Thomas 1968), however, more current information from sport and commercial fishermen indicate that white seabass aggregate on inshore sandy bottom areas during spawning events where they become vulnerable to the heaviest fishing pressure. Therefore, to effectively provide some protection to these fish utilizing reserves as a management tool would require setting aside sandy bottom areas at the

offshore islands. When not aggregated, traditional fishery management tools (size limits, bag limits, and seasonal closures) appear to offer more protection to white seabass than MPAs.

Nearshore Rockfishes (Genus *Sebastes*)

Thirteen fishes of the genus *Sebastes* (rockfish) are included in the State's list of nearshore species defined in Title 50, Code of Federal Regulations, Parts 600 and 660 as Nearshore Rockfish. These are: black, black-and-yellow, blue, brown, calico, China, copper, gopher, grass, kelp, olive, and quillback rockfishes, and treefish.

Black Rockfish (*Sebastes melanops*)

Status of the Population:

Although no fishery-independent population estimates have ever been made of black rockfish stocks in California, substantial information exists on relative abundance and length frequency from fishery-dependent surveys. Black rockfish are a component of both commercial and recreational fisheries, with increasing importance from San Francisco northward. Data from the 1981-1986 Marine Recreational Fishery Statistics Survey (MRFSS) survey showed a 23 percent decline in the average weight of black rockfish taken compared with fish taken between 1958 through 1961. Onboard observations from CPFVs in the San Francisco area documented a significant change in the length frequency of the sampled catch from 1989 to 1990. During that period, the occurrence of larger adult black rockfish (greater than 15 inches) declined precipitously. This occurred during a time when nearshore commercial hook-and-line fishing effort and landings were expanding. Mean length in the sampled catch from the San Francisco area declined from 14.3 inches in 1988-1989 to 12.1 inches in 1990-1991, and has ranged from 11.4 to 12.6 inches annually from 1993 to 1998. This is well below the average length at 50 percent sexual maturity. Since 1993, all other CPFV port areas from Fort Bragg south to Morro Bay have yielded similar low mean lengths. Results from commercial fishery sampling are consistent with the above; 296 black rockfish sampled from the Morro Bay area commercial nearshore fishery from 1993 to 1997 averaged 12.2 inches. Coincident with these observed declines in mean length were increased catch rates (catch-per-angler-hour) observed in the CPFV fishery in central California, particularly from 1994 to 1997. Thus, the observed decline in mean length maybe partially related to strong recruitment, and, in spite of increased fishing effort on black rockfish in recent decades, localized populations of adults still must be present in California to provide this recruitment.

Black-and-Yellow Rockfish (*Sebastes chrysomelas*)

Status of the Population:

While there have been several studies of local abundance for black-and-yellow rockfish, there is no comprehensive assessment of their population.

Blue Rockfish (*Sebastes mystinus*)

Status of the Population:

The blue rockfish is one of the most important recreational species in California (Leet et al. 2002). It is usually the more frequently caught rockfish north of Point Conception for anglers fishing from CPFVs and skiffs, is also important to divers, and is occasionally caught by shore anglers. Only a small portion of blue rockfish are from commercial landings, however, they have become a minor component of the live fish fishery (Leet et al. 2002) Although no fishery-independent population estimates have ever been made of blue rockfish stocks, it appears that they have withstood considerable fishing pressure over the last four decades and continue to be healthy north of Point Conception. However, there is evidence of a decline in blue rockfish stocks off southern California since the 1970s.

There is a well-documented difference in the population structure between northern and central California stocks. Northern stocks are generally characterized by a wider size range of adults, a higher proportion of adults greater than 15 inches and a correspondingly greater mean length, less variability in annual recruitment, and most likely a higher growth rate. These attributes are likely a result of a combination of greater fishing pressure and a greater influence of anomalous oceanic conditions such as El Niño events in central California. Greater variability in annual recruitment results in occasional strong year classes that cause strong length-frequency modes in the population; this occurred four times in recreational fishery samples obtained from 1959 to 1983 in central California. It is believed that the last exceptionally strong year class of blue rockfish in central California occurred in 1988, which is cause for concern. However, a relatively strong year class also was observed in 1999. In 1993, when the majority of the 1988 year class had become available to recreational anglers, mean lengths in the sampled catch declined substantially in central California. For example, mean length of blue rockfish sampled from Monterey area CPFVs declined from 11.9 inches in 1992 to 11.0 inches in 1993. In heavily fished and well-sampled populations of rockfish, changes in annual mean length from one year to the next are commonly less than 0.5 inches. The total number of blue rockfish caught in recreational fisheries increased substantially from the late 1950s to the mid-1980s, concurrent with increased effort. However in the past 15 years recreational fishing effort has been variable but has not shown a consistent increase; the recreational catch of blue rockfish has shown the same pattern. However, increased commercial fishing in the nearshore area during the same period has put additional stress on blue rockfish populations.

Brown Rockfish (*Sebastes auriculatus*),

Status of the Population:

While there have been studies of local abundance in certain coastal areas and within bays, the population size and structure of this species has not been comprehensively assessed. Evidence of stress on brown rockfish stocks in California exists, however,

and some relative changes in the population have been identified. Commercial and recreational catches have steadily increased during the last 40 years, while the average length and weight of brown rockfish in landings have declined. When recreational statistics collected during the last 20 years were compared to results from a 1958 through 1961 recreational survey, brown rockfish showed a 49 percent decrease in average weight per fish over 30 years. Mean length of brown rockfish obtained from CPFVs and private recreational boats in northern California declined by 18 percent and 21 percent, respectively, over 40 years. In southern California, mean length in the CPFV catches declined by 31 percent during the same period. In relation to the length at which 50 percent of males and females are mature, recreational landings data indicate that from 1958 to 1961 most brown rockfish taken had reached sexual maturity. By the 1980s, however, few fish taken from shore or from bays, and about half taken from private recreational boats were sexually mature. Lengths of brown rockfish sampled from commercial landings during the last decade also reflect that half of the fish were at or below the size at which 50 percent of the population is sexually mature, and few larger adult fish were being landed compared to historic values. The decline in size of fish in these fisheries does not seem to be associated with incoming year classes, but instead with a depletion of larger adults due to fishing pressure. Although nearly half of the fish landed statewide are adults that can replenish the population, there are now few large adults above the length of the median-sized fish recorded in the 1958 through 1961 survey (Leet et al. 2002). The brown rockfish has been identified as a species vulnerable to severe localized depletions in other geographic areas; in Washington State, the Puget Sound stock of brown rockfish was recommended for listing as a threatened species in 1999 (Leet et al. 2002).

Calico Rockfish (*Sebastes dallii*)

Status of the Population:

There are currently no estimates of abundance for calico rockfish in California. There were more calico rockfish landed annually by sport anglers in the 1980s than in the 1990s, which may have reflected the abundance of that species during two strong El Niño events that occurred in the 1980s. Whether the reduced calico rockfish catch during the 1990s was a result of changing oceanic conditions or was due to actual depletion of calico rockfish stocks by sport and commercial fisheries is not known. Because of the relatively small size of adult calico rockfish, they are not usually targeted by either sport or commercial fishermen. Calico rockfish appear as bycatch in prawn trawls and other nearshore fisheries in southern California and are caught by sport anglers on CPFVs and private boats when they are fishing for other, larger benthic species.

China Rockfish (*Sebastes nebulosus*)

Status of the Population:

While there have been several studies of local abundance for China rockfish, there is no comprehensive assessment of their population.

Copper Rockfish (*Sebastes caurinus*)

Status of the Population:

Over the past 20 years, copper rockfish have become a less frequent component in the nearshore environment (Leet et al. 2001). There has been no stock assessment of copper rockfish in California (Leet et al. 2001). However, there is compelling evidence that copper rockfish populations have severely declined in many areas and large individuals are noticeably less common than in past decades. Department research cruise data and diving observations have noted fewer copper rockfish and smaller average sizes in areas where they were previously abundant. Fishery dependent data show significant decreases in recreational catch between the periods of 1958 to 1961 and 1981 to 1986 (Karpov et al. 1995). Catches in spearfishing competitions have similarly declined, with fewer fish landed and smaller average sizes. Due to their solitary nature, high habitat specificity, and the size (juveniles) at which they can enter the fishery, the copper rockfish is a prime candidate for local depletion (Leet et al. 2001).

Gopher Rockfish (*Sebastes carnatus*)

Status of the Population:

While there have been several studies of local abundance for gopher rockfish, there is no comprehensive assessment of their population.

Grass Rockfish (*Sebastes rastrelliger*)

Status of the Population:

While there have been several studies of local abundance for grass rockfish, there is no comprehensive assessment of their population.

Kelp Rockfish (*Sebastes atrovirens*)

Status of the Population:

While there have been several studies of local abundance for kelp rockfish, there is no comprehensive assessment of their population.

Olive Rockfish (*Sebastes serranoides*)

Status of the Population:

Historically, olive rockfish have been common in the recreational fishery as far north as Fort Bragg and were particularly important from central California to the northern Channel Islands (Leet et al. 2001). As late as the 1980s, olive rockfish were a very important recreational species throughout much of southern California. However, a combination of overfishing and poor recruitment brought about by changes in oceanographic conditions led to a steep decline (83 percent) in southern CPFV catches between 1980 and 1996 (Leet et al. 2001). There has been no stock assessment of this species. However, there is clear evidence that olive rockfish have declined in abundance south of Point Conception (Leet et al. 2001) and most likely also off central California.

Quillback Rockfish (*Sebastes maliger*)

Status of the Population:

While no stock assessment has been done for quillback rockfish in California, length-frequency data exist on their occurrence in the recreational fishery in northern and central California, as well as in the commercial fishery from the same region (Leet et al. 2001). Between the late 1980s and mid-1990s, quillback rockfish experienced increased take by the commercial fishery as the market demand for premium, live fish increased, yet no significant trend was noted in the average size of fish. Fishing pressure has relaxed somewhat in recent years because of restrictions placed on the fishery. Concern over sustainability of the commercial and recreational nearshore fishery has made this species of particular interest to fishery managers (Leet et al. 2001).

Treefish (*Sebastes serriceps*)

Status of the Population:

While there have been several studies of local abundance for black-and-yellow rockfish, there is no comprehensive assessment of their population.

Nearshore Rockfish

Current Regulations

Nearshore rockfish are a complex of 13 species of rockfish subject to both federal and state laws and regulations. These species are managed pursuant to the Federal Pacific Coast Groundfish Fishery Management Plan (Groundfish Plan) adopted by the Pacific Fishery Management Council (PFMC) and under laws and regulations adopted by the California Legislature and Commission. Council management and regulation of

nearshore rockfish includes an annual harvest guideline for the entire minor nearshore rockfish complex that is allocated between recreational and commercial fishery sectors, and two-month cumulative catch limits for segments of the commercial fishery. California has enacted laws [Marine Life Management Act (Chap. 1052, Stats. 1998) and Nearshore Fishery Management Act (Chap. 1053, Stats. 1998)] and Commission regulations to protect the juveniles of some nearshore rockfish, and to develop more comprehensive and sustainable management of these and other important nearshore fishes. Foremost in these efforts is the development of a Nearshore Fishery Management Plan (Nearshore FMP). The Nearshore FMP along with implementing regulations has been submitted to the Commission for their review and consideration, with final adoption and certification expected in October 2002.

Commercial Fishery: The commercial fishery for nearshore rockfish is regulated using a combination of minimum sizes, reporting requirements, season and area restrictions, and catch limits as follows:

- Commercial fishermen must possess a “nearshore fishery” permit to take ten species of nearshore fishes, including five species of nearshore rockfish (black-and-yellow, China, copper, gopher, grass, and kelp).
- The minimum commercial size limit for black-and-yellow, gopher, and kelp rockfishes is 10 inches total length, and for China and grass rockfishes is 12 inches total length.
- Regulation changes adopted in June 2002 by the Council prohibit fishing for minor nearshore rockfish outside 20 fathoms south of 40 degrees, 10 minutes North Latitude, near Cape Mendocino, Humboldt County.
- Fishing for nearshore rockfish is authorized in waters less than 20 fathoms south of 40 degrees, 10 minutes North Latitude.
- Two-month cumulative catch limits exist on minor nearshore rockfish between Cape Mendocino and Point Conception, Santa Barbara County, and between Point Conception and the U.S.-Mexico border.
- Nearshore rockfish for which there are size limits must be measured immediately on being brought aboard and released immediately if not in compliance with the size limit.
- Nearshore rockfish must be sorted by species prior to weighing and the weight reported separately on the Department receipt.

Recreational Fishery: The recreational fishery for nearshore rockfish is regulated principally with a bag limit, hook limit, and area and season closures as follows:

- The bag limit for rockfish is ten rockfish per day in combination of species (includes nearshore, shelf, and slope species).
- Not more than two hooks and one line may be used when sport fishing for rockfish.
- Rockfish fillets must have the entire skin attached; and brown skinned rockfish fillets must be a minimum of six and one-half inches in length, and bocaccio fillets must be a minimum of five inches in length.

- Regulation changes adopted in June 2002 by the Council prohibit fishing for rockfish, including nearshore rockfishes, outside 20 fathoms south of 40 degrees, 10 minutes North Latitude, near Cape Mendocino, Humboldt County.
- Fishing for rockfish, including nearshore rockfish, is closed in waters less than 20 fathoms deep during November and December 2002 south of Cape Mendocino as a result of Council action taken in 2001. A seasonal closure on take of rockfish, including nearshore rockfish, between Point Conception and 40 degrees 10 minutes North Latitude is in effect from March through April
- During rockfish closures specific to waters 20 fathoms or greater, fishing and possession of rockfish is authorized in waters less than 20 fathoms in depth along the mainland coast and around offshore islands and rocks (excluding reefs and banks) (including nearshore rockfish, but not more than two shelf rockfish other than bocaccio, canary, cowcod, and yelloweye rockfish).

How MPAs May Help:

Nearshore rockfishes appear to be excellent candidates for enhancement of populations using an MPA management approach. In addition to being highly residential and moderate to long-lived, they are extremely fecund (with older, larger individuals producing the majority of sperm and eggs) and generally have a lengthy larval life stage. Marine protected areas would protect critical spawning stock biomass and potentially ensure a continual recruitment supply to fished areas via larval dispersal. A system of MPAs would allow scientists and resource managers to compare habitats and ecological communities in fished and unfished areas and determine if observed changes are caused by human activity or environmental change. To gain the fullest range of potential expected benefits, the network of MPAs would need to encompass a representative portion of a species habitat.

As noted in the introduction, examples of beneficial effects of MPAs on rockfish size, population structure, and reproductive potential exist (Palsson 1998; Palsson and Pacunski 1995; Paddock 1996). These examples specifically show that within MPAs rockfish reach larger sizes and have significantly higher potential for producing larvae. Based on the larval behavior, this production has a definite potential to influence areas outside MPAs.

Shelf Rockfishes (Genus *Sebastes*)

Thirty-two fish of the genus *Sebastes* are defined as shelf rockfish in Title 50, Code of Federal Regulations, Parts 600 and 660. They are: bocaccio, bronzespotted, canary, chameleon, chilipepper, cowcod, dwarf-red, flag, freckled, greenblotched/pink, greenspotted, greenstripe, halfbanded, honeycomb, Mexican, pinkrose, pygmy, redstripe, rosethorn, rosy, shortbelly, silvergray, speckled, squarespot, starry, stripetail, swordspine, tiger, vermillion, widow, yelloweye, and yellowtail rockfish.

Status of the Population:

The current status of many rockfishes off the west coast is poor, and significant changes in the groundfish fishery have been necessary to address this situation. There are over 60 different species of rockfish in California. Formal assessments of these fish populations are challenging, due to the number of species and the large commitment of time and effort to conduct the necessary research and analysis. To date, 15 shelf rockfish species have been formally assessed, and the results are not encouraging. Nearly all of these species are currently below optimal abundance levels. Six shelf rockfish species, including four that are important to California anglers and commercial fishermen (bocaccio, canary rockfish, widow rockfish and cowcod), are at such low levels (estimated at or below 25 percent of the unfished population of each species) that they have been declared overfished by the Pacific Fishery Management Council (PFMC). Federal law requires that steps be taken to rebuild overfished stocks under strict guidelines that place an emphasis on a reasonable likelihood of achieving success within specified time periods for each species.

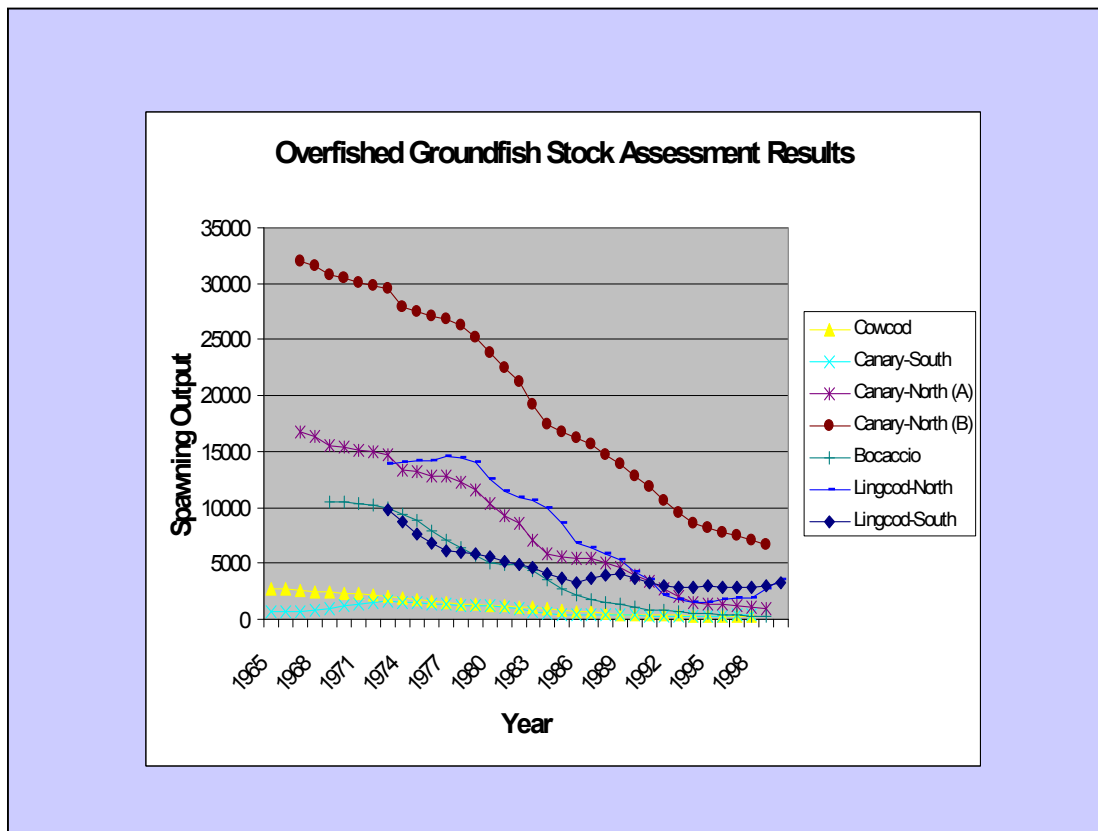
Several factors affect the abundance of rockfishes and the ability to manage them effectively. Recent analyses have shown that rockfish stocks are not as productive as previously thought. This is due in part to improved information about rockfish life history (such as age, growth, and reproduction), better stock assessments and poor environmental conditions that generally have not been favorable to rockfish reproduction or survival since the 1980s. As a result, rockfishes cannot support harvest rates as high as previously thought. Management is further complicated because the habitats and ranges of many rockfish species overlap, so that it is difficult to catch one species without catching other species at the same time. Fishing must be reduced for an entire group of rockfish with similar life histories and habitat preferences in order to realize lower catches that are necessary to rebuild overfished species. For example, although a few shelf rockfish species such as chilipepper and yellowtail appear to be comparatively healthy, their allowable take has been set at levels below the potential yield to protect the weaker species of shelf rockfish that tend to be caught with them, such as bocaccio and canary.

Prior to 2000, the allowable catch of all rockfish in the PFMC's southern management area for rockfish (most of California) was combined into a single quota. To better align fishing opportunities with the resources that support them, fishery managers grouped rockfish into three new categories in 2001: nearshore, shelf, and slope. In addition,

management has been refined by setting individual quotas for a few species, which reduces the aggregate quota for other remaining rockfish species.

In order to return depressed rockfish and lingcod stocks to a healthy condition, all fisheries must share in the conservation measures needed for recovery. For the recreational fishery, bag limits have been reduced, gear restrictions imposed, seasons closed, and minimum size limits established. In the commercial fishery, the aggregate rockfish quota for 2001 was reduced by about 57 percent compared to 1997. Rockfish rebuilding plans call for decades of ongoing special efforts to allow the overfished species to recover. Federal rebuilding plans generally call for at least a 50 percent probability of rebuilding within the allotted time. Establishment of an MPA network would increase the probability of successful rebuilding under conditions where all other aspects of rebuilding remain as specified under the proposed plans.

Following is a depiction of trends in abundance for several overfished shelf groundfish species from recent stock assessments:



Current Regulations for Shelf Rockfish:

In order to prevent overfishing and achieve the lower catches necessary to rebuild cowcod, bocaccio, yelloweye, widow, and canary rockfishes, the following west coast Optimum Yields (OYs) were established by the PFMC for shelf rockfish during 2002:

Species/Group	Allowable Catch - MT (OY)	Area
Widow Rockfish	856	Coastwide
Canary Rockfish	93	Coastwide
Chilipepper Rockfish	2000	South of C. Mendocino
Bocaccio	100	South of C. Mendocino
Yellowtail Rockfish	3146	North of C. Mendocino
Cowcod	5	South of C. Mendocino
Yelloweye Rockfish	14	North of Pt. Conception
Other Shelf Rockfish		
North	978	North of C. Mendocino
South	914	South of C. Mendocino

Several new regulations were imposed on the recreational fishery for 2002, and a number of other recent restrictions were continued:

- Four-month season closures are imposed during January-February and November-December for lingcod and rockfish, in waters south of Point Conception.
- Between Point Conception and Cape Mendocino, fishing for shelf rockfish and lingcod is only permitted during January-February and July-August.
- Between Point Conception and Cape Mendocino, fishing for nearshore rockfish is only permitted during January-February and May-October, with incidental allowance (2 fish) of shelf species (excluding bocaccio, cowcod, canary and yelloweye rockfish) during May-June and September-October.
- The overall combined rockfish daily bag limit remains at 10 fish.
- The lingcod minimum size limit is reduced to 24 inches.
- Within the overall rockfish bag limit, only 2 fish may be bocaccio, and 1 may be canary, or yelloweye rockfish.
- A minimum size of 10 inches is continued for bocaccio.
- Retention of cowcod is prohibited.
- No more than one line and 2 hooks may be used when fishing for rockfish and lingcod.

Commercial fishing for shelf rockfish has been greatly restricted in recent years, and targeting by trawl gear has been virtually eliminated. In order to remain within the optimum yields that have been established by the PFMC for 2002, a complex set of bi-monthly cumulative trip limits were established for the various species and species groups of rockfish. In addition to the trip limits, four month closures south of Point

Conception (January-February and November-December), and eight month closures between Cape Mendocino and Point Conception (March-June and September-December) were established to prohibit commercial fishing for shelf rockfish during those periods.

Special MPAs known as the Cowcod Conservation Areas (CCAs) were established in the southern California Bight in 2001 to achieve rebuilding yields for cowcod. Bocaccio rebuilding will also benefit from the CCAs. Fishing for shelf and slope groundfish and prawn trawling is prohibited within the closures, because those fishing activities have unavoidable bycatch of cowcod. The closures are expected to reduce cowcod landings by 55 percent, which is necessary to lower overall catches in the area to the rebuilding target of 2.4 mt south of Point Conception. It is anticipated that the closures will remain in effect throughout the cowcod rebuilding period which may take as long as 97 years.

How MPAs May Help:

As demonstrated by the CCAs (above), MPAs may be well-suited for rebuilding overfished shelf rockfish species in certain circumstances. In addition, MPAs have the potential to prevent catastrophic population collapse due to inadvertent overfishing such as has occurred for cowcod, bocaccio, yelloweye, widow, and canary rockfishes, providing a network of MPAs is established before the populations become overfished. Since the threshold for declaring a population as overfished is 25 percent of the unfished abundance, a network of MPAs that protect a significant fraction of the population from fishing pressure (greater than 10 percent of the population and associated habitat) would significantly reduce the risk that the overall population would drop below the overfished threshold. For instance, if 25 percent of an unfished population were protected from fishing inside MPAs, there would be almost no chance that the overall population could be described as overfished using the Federal definition, even under data-poor management conditions. If 25 percent of a stock population is protected, then the overall abundance would be unlikely to drop below 25 percent.

The recent track record shows that even data-rich stocks such as bocaccio and canary rockfish have become overfished, and actively managed and well-studied species such as these would also benefit from the reduced risk of management mistakes provided by an MPA network. This is one of the clearest examples of the insurance factor provided by MPAs against management uncertainty. Preventing stocks from becoming classified as overfished is an important consideration in weighing the costs and benefits of establishing an MPA network.

Reproductive output from protected portions of spawning populations found within the boundaries of MPAs may be dispersed by currents during the larval life phase, and then recruit to fishing grounds outside the MPAs. This potential enhancement of fisheries may lead to higher catches than would otherwise be allowable. Despite the potential for insurance against management mistakes, it is important to recognize that MPAs would not eliminate the need for active management in fishing grounds that remain open in

order to maintain healthy populations and ecosystems throughout the marine environment.

California Sheephead (*Semicossyphus pulcher*)

Status of the Population:

Compared to some nearshore species, California sheephead have supported relatively minor sport and commercial fisheries. Sport landings through the 1980's and 1990s have consistently averaged between 40,000 and 70,000 fish annually. Most of this was from southern California. Commercial landings increased rapidly during the 1990s with the development of the live fish trap fishery. Landings reached a peak in 1997 at 366,000 pounds and declined through 1999, though value remained high. Since then landings have fluctuated annually around 150,000 pounds.

Long-term studies at two localities in southern California, Palos Verdes Point and the King Harbor breakwater, have shown that the species was not abundant in the cool period of the early 1970s (Leet et al. 2001). The population increased at both sites with the onset of the little El Niño of 1977-1978. At King Harbor, the population peaked in 1978, decreased through the end of the great El Niño of 1982-1983, and remained low until the early 1990s when it again reached a large size (1994 and 1998) (Leet et al. 2001). With the exception of 1982-1983 El Niño, the population seems to increase during El Niño conditions and this is reflected in increased recruitment. At Palos Verdes, the population peaked in 1981, then declined until 1983, but has remained relatively stable since (Leet et al. 2001). At maximum, the density of sheephead at the Palos Verdes kelp bed was three times that of the King Harbor breakwater. There is no evidence from these very limited data that the population is threatened by existing fishery practices (Leet et al. 2001).

Home Range/Migratory Patterns:

Sheephead are a common inhabitant of reef/kelp areas. They can be found from shallow water to a depth of at least 280 feet, although they are most abundant in kelp bed depths. They range from Monterey Bay to the Gulf of California, but are not common north of Point Conception (Love, 1991). They are not migratory and are believed to be territorial and do not move far from their home reef.

Current Regulations:

Commercial fishermen must possess a nearshore finfish permit to take California sheephead. The minimum size limit is 13 inches total length. Sheephead may not be taken commercially north of Point Conception in March and April and south of that point in January and February.

The recreational minimum size limit is 12 inches total length. Five fish per day may be taken except that no fish may be taken in waters greater than 20 fathoms in the Cowcod Conservation Areas.

The Commission has established a combined recreational and commercial optimum yield for sheephead at 50 percent of recent catches as an interim precautionary measure because of the current data poor status of sheephead and to provide protection against overfishing. The optimum yield was set at 223,483 pounds for total allowable catches, with 135,524 pounds allocated to the recreational fishery and 87,959 pounds allocated to the commercial fishery. California sheephead is included in the Nearshore Fishery Management Plan. As noted above, the little data available suggest that current regulations are sufficient to protect California sheephead. Concern exists, however, for localized reductions of large individuals.

How MPAs May Help:

Sheephead may live for 50 or more years and attain a weight of 36 pounds. Few large individuals are found today due to fishing pressure. The California sheephead is a major predator of urchins and other invertebrates in the kelp bed community. Overpopulation of urchins has resulted in the loss of kelp in some areas. The protection of larger sheephead in MPAs might alter the relationship between urchins and kelp, resulting in significant changes to the dynamics of the local ecosystem. Since such reserves would protect other exploited species as well, the ecosystem functions of sheephead might be altered as a result of more intense competition and predator/prey interactions. Similarly, reserves would also protect habitats valuable to sheephead from a variety of potential fishing activity related impacts.

Studies on sheephead in the existing MPAs at Catalina and Anacapa Islands, and La Jolla have shown that size and abundance of sheephead are higher inside these reserves than outside (Beers and Ambrose In Prep.). It can be anticipated that relatively large reserves would allow for an increase in numbers and sizes of sheephead within the reserves.

Relatively large sized reserves can act to assure the continuing health of the sheephead population if changes in the exploitation levels occur, or if unforeseen environmental fluctuation results in a significant decline and sustainability of stocks. This insurance scenario would require that some significant portion of the stock is placed under reserve protection.

Sheephead are protogynous hermaphrodites; they begin life as females, with older, larger females developing into males. Female maturity occurs at three to six years, and fish may remain as females up to fifteen years. Timing of transformation involves population sex ratios as well as size of available males and sometimes does not occur at all (Leet et al. 2002). It would be expected that large MPAs would protect populations of large adult sheephead and delay the metamorphosis of females to males. These larger individuals have significantly higher reproductive potential than smaller individuals. However, since there does not appear to be a deficit in recruitment potential under the present management, any potential benefit through increased larval reproduction might be outweighed by the loss to the fishery from closing large areas of fishing grounds.

Since sheephead are primarily territorial and do not display significant movement, movements of individuals outside of reserves should not be expected to contribute significantly to fishery catches in areas adjacent to reserves.

Cabazon (*Scorpaenichthys marmoratus*)

Status of the Population:

Limited information is available on population biology or changes in biomass over time (Leet et al. 2001); this is considered a data-poor situation. Recent increases in commercial fishing pressure on cabazon have intensified efforts to learn more about their life history characteristics, population biology, and to assess stock size. As a primarily recreational fishery for many years, catches from the CPFV fishery from 1947 to 1980 indicate that catches of cabazon were declining (Leet et al. 2001).

Recreational landings have further declined concurrent with the increase in commercial fishing efforts and reported commercial landings. As fishing effort increases, it is likely that populations living in heavily utilized areas will decline further (Leet et al. 2001). Furthermore, as one of the nest-guarding species, cabazon are particularly vulnerable to spear divers and fishermen alike.

Home Range/Migratory Patterns:

Although not known, it is likely cabazon are residential and non-migratory. Cabazon normally occur nearshore, except as larvae. As fish get older, and larger they tend to migrate to deeper water. In shallower water, they migrate in and out with the tide to feed. Many California sculpin (Family Cottidae) species are highly territorial, which suggests cabazon may also be.

Current Regulations:

Commercial fishermen must possess a nearshore finfish permit to take cabazon. The minimum size limit is 15 inches total length. The commercial take of cabazon is prohibited from Thursday through Sunday, inclusive. Cabazon may not be taken commercially north of Point Conception to 40 degrees, 10 minutes north latitude (near Cape Mendocino) in March and April. They also may not be taken commercially south of Point Conception to the Mexican border during January and February.

The recreational minimum size limit is 15 inches total length. Recreational fishermen may possess no more than 10 cabazon.

Cabazon may not be taken in waters equal to or greater than 20 fathoms in the Cowcod Conservation Areas.

The Commission has established a combined recreational and commercial Optimum Yield for cabazon at 50 percent of recent catches as an interim precautionary measure because of the current data poor status of cabazon and to provide protection against overfishing. The Optimum Yield was set at 178,000 pounds for total allowable catches, with 84,000 pounds allocated to the recreational fishery and 94,000 pounds allocated to the commercial fishery. Cabazon is included in the Nearshore Fishery Management Plan.

How MPAs May Help:

Benefits most likely to accrue to cabezon are protection of a portion of the stock from localized depletion, protection of a portion of the available spawning biomass, protection of nest-guarding males and nests, and contribution to neighboring fished areas from the "export" of juveniles and to more remote areas via the transport of larvae. These benefits can best be realized when MPA sizes are commensurate with the movement patterns of cabezon. If the MPA is not large enough to protect some individuals completely then the chances of success are greatly diminished.

Additionally, if MPAs are so far apart that larval transport does not result in larvae being deposited inside closed areas, there will be limited replacement of adult fish except by larval transport and movement of fish from fished areas. It is suggested that MPAs established for this species also include intertidal areas because newly settled cabezon recruit there, and larger fish often move up to feed in the intertidal. These benefits are based on the assumptions that cabezon are residential and not migratory, possess a home range comparable to other nearshore species being protected, and that their major prey items (such as crabs, lobster, and abalone) are protected as well (eg, crabs, lobster, and abalone).

Kelp Greenling (*Hexagrammos decagrammus*)

Status of the Population:

There are no estimates of abundance for kelp greenling in California. The yearly sport catch remained relatively constant during the first ten years (1980-1989) it was surveyed, but has declined steadily from 1993 to 1999 (Leet et al. 2001). Since decline in catch may be one symptom of overfishing, this could be an indication that current levels of fishing are having adverse effects on the population, although no population data are available at present to confirm this. Spear fishermen could overfish local populations, however, because they can select individual targets, and greenlings are particularly vulnerable to spears when guarding their nests. Also, although commercial catch has been traditionally very low compared to recreational catch, the increased fishing pressure in recent years by the nearshore live fish fishery could have a much broader impact on the kelp greenling population in California (Leet et al. 2001).

Home Range/Migratory Patterns:

Kelp greenling are solitary, territorial fish. Not much is known about their home range or migratory patterns.

Current Regulations:

While kelp greenling are currently listed in the Federal Groundfish Plan for Pacific coast groundfish, they are not actively managed by the Pacific Fishery Management Council and are managed instead by the state. Many of the current regulations applying to kelp greenling also include a similar species, the rock greenling (*Hexagrammos lagocephalus*).

Commercial fishermen must possess a "nearshore finfish" permit to take kelp greenling and rock greenling. The minimum size limit is 12 inches total length for greenlings. The commercial take of greenlings is prohibited from Thursday through Sunday, inclusive. Greenling may not be taken commercially north of Point Conception to 40 degrees, 10 minutes North Latitude (near Cape Mendocino) in March and April. They also may not be taken commercially south of Point Conception to the Mexican border during January and February.

The recreational minimum size limit is 12 inches total length. Recreational fishermen may possess no more than 10 kelp greenling.

Kelp and rock greenlings may not be taken in waters equal to or greater than 20 fathoms in the Cowcod Conservation Areas.

The Commission has established a combined recreational and commercial Optimum Yield for greenlings of the genus *Hexagrammos* at 50 percent of recent catches as an interim precautionary measure because of the current data poor status of greenlings

and to provide protection against overfishing. The Optimum Yield was set at 39,800 pounds for total allowable catches, with 26,400 pounds allocated to the recreational fishery and 13,400 pounds allocated to the commercial fishery. Greenlings are included in the Nearshore Fishery Management Plan.

How MPAs Might Help:

There is no information specifically identifying benefits of MPAs for kelp greenling. As a solitary, territorial species, MPAs would likely protect individuals within their boundaries from take by fishing. It is expected that because of the similarities in life history between kelp greenling and cabezon that many of the same benefits which could accrue to cabezon would also apply to kelp greenling, such as potential to increase spawning biomass). It is suggested that MPAs established for this species also include intertidal areas because kelp greenling utilize intertidal as well as nearshore habitat.

Garibaldi (*Hypsypops rubicundus*)

Status of the Population:

There has never been any significant sport fishery for garibaldi (Oliphant et al. 1990). During the 1990s a commercial aquarium trade developed for juvenile garibaldi. At its peak, over 800 pounds were recorded. Although not substantial in terms of weight, because the fish were juveniles, these landings represented a large number of individuals. Since most of this take focused on one area, Catalina Island, there was concern for local depletion. In 1995 the California Legislature designated the Garibaldi as the Official State Marine Fish and banned any further commercial take. Garibaldi populations have rebounded from the local effects of commercial take and are in good condition throughout their range in southern California.

Home Range/Migratory Patterns:

Garibaldi range from Monterey Bay to Guadalupe Island, Baja California. In California they are rare above Point Conception, but larvae and juveniles are transported to the north during El Niño events. They are very territorial on rocky reefs, ranging from shallow sub-tidal to a depth of 95 feet (Love, 1991). Males build and defend nests, attending the eggs until they hatch. An individual may utilize the same nest site for many years.

Current Regulations:

No commercial or recreational take is allowed.

How MPAs May Help:

Since garibaldi is a protected species throughout California, adults of all sizes are already common. Accordingly, no significant population benefits can be expected to result from the full range of size classes afforded by the establishment of reserves. However, since such reserves would protect other exploited species as well, the ecosystem functions of garibaldi might change. Similarly, reserves would protect habitats valuable to garibaldi from a variety of potential fishing activity related impacts. Garibaldi are territorial and do not appear to migrate. Protection in MPAs would not be expected to provide for spillover of adult fish and it is likely that garibaldi are already at maximum densities. Some larval transport to distant areas would be expected, however this would not be expected to have significant impacts on populations as the garibaldi is already protected and at good population levels.

Sea Urchins

Red urchin (*Strongylocentrotus franciscanus*).

Status of the Population:

The relative abundance of red urchins has declined since the 1970s (e.g., Carroll et al. 2000). In southern California, the red sea urchin resource now produces about 10 million pounds annually, with harvestable stocks (defined as exceeding the minimum legal size and containing marketable gonads) in decline since 1990 (Leet et al. 2001). Between 1985 and 1995, the percentage of legal-sized red sea urchins at survey sites in the northern Channel Islands declined from 15 percent to 7.2 percent (Leet et al. 2001). Although fishing has significantly reduced density in many areas and catch-per-unit of effort has decreased, localized juvenile recruitment has, thus far, somewhat mitigated fishing pressure (Leet et al. 2001). Consistent recruitment has been noted on artificial settlement substrates and along subtidal transects over the last decade at monitoring stations along the southern California mainland coast and the northern Channel Islands (Leet et al. 2001). This may be partly due to ocean current patterns in the Southern California Bight, where water retention may increase the chances for larvae to encounter habitat suitable for settlement. Continued recruitment at present levels, however, is not guaranteed; in fact, intensive sea urchin take in northern California and Baja California could result in a decrease in sea urchin larvae in southern California in the future.

The northern California fishery has been characterized by rapid growth to 30 million pounds in 1988 and decline to less than five million pounds in the late 1990s (Leet et al. 2001). Fishery dependent modeling of the sea urchin fishery during the period of rapid decline estimated that the 50,800 tons of red urchins taken between 1988 and 1994 represented about 67 percent of the fishable stock available at the start of 1988 (Leet et al. 2001). Effort declined during this period as the 126 divers who had worked exclusively in northern California during 1991 had dwindled to 69 by 1995 (Leet et al. 2001). Annual catch per permittee declined by 57 percent from 1990 to 1995. Densities of fishable stocks continue to be depressed at subtidal survey sites examined in the Fort Bragg area since 1988. From 1988 to 1997, legal-sized red urchins surveyed outside of reserves, declined from 47 percent to 20 percent of the population, and from 0.8 per square meter to 0.2 per square meter surveyed (Leet et al. 2001). In contrast, during this period densities in two area reserves averaged over 3.0 red urchins per square meter (Leet et al. 2001). These patterns were observed to continue during northern California surveys in 1999 and 2000 (Leet et al. 2001). Episodic and infrequent recruitment combined with intensive take on the north coast have had a serious impact upon catches, as the fishery has evolved into a recruitment fishery, with fishermen targeting newly recruited sea urchins (Leet et al. 2001).

Purple urchin (*Strongylocentrotus purpuratus*).

Status of the Population:

Coincident with the decline of competing red urchins, purple urchins populations have increased tremendously at many island sites, creating vast areas denuded of macroalgae (Harold and Reed 1985; Ambrose et al. 1993; Engle 1994; Richards et al. 1997; Carroll et al., 2000, Lafferty and Kushner 2000). A small fishery has existed sporadically for this species which peaked in 1992 at 400,000 pounds and then declined to less than 50,000 pounds in 1999 (Leet et al. 2001). Larval settlement rates monitored at a number of locations in southern and northern California over the past 10 years do not indicate a change in larval production and recruitment patterns, which indicates that the status of this species appears to be stable (Leet et al. 2001).

Sea Urchins

Home Range/Migratory Patterns:

Purple and red sea urchins are found all along the west coast, from Mexico to Alaska. Purples are the most abundant on California's coast and occur in large numbers in intertidal regions. Reds inhabit the low intertidal to depths of 125 meters.

Sea urchin movements appear to be primarily in response to food shortages, such as occur during El Niño events when kelp beds can die off; urchins may aggregate and move in front denuding the remaining kelp forests. Sea urchins apparently do not make other movements or migrations.

Current Regulations:

The dive fishery for sea urchins is restricted access with 385 permittees. The current capacity goal, established in the early 1990s, is 300 divers. There is an annual urchin lottery to allow new participants into the fishery if any permits are available. There are closed days and weeks in April through October when red sea urchins may not be taken. Purple urchins may be taken at any time. In southern California, no red urchin between 1-1/2 and 3-1/4 inches shell diameter may be taken. In northern California no red urchin between 1-1/2 and 3-1/2 inches shell diameter may be taken. Additionally, there is a 20-landing requirement for renewal of the annual permit, and logbooks are required.

Recreational fishermen may take up to 35 urchins (in combination of species) of any size.

In the Master Plan required by the Marine Life Management Act, sea urchins were ranked in the top three fisheries in need of a fishery management plan. The Department is planning to develop research protocols in the coming year, and to proceed with an urchin FMP in the future. The red sea urchin fishery appears to be fully exploited in California, and evidence from a variety of sources suggests overfished

conditions in northern and portions of southern California. Various management actions could be applied to improve this situation including increased fishery-dependent and fishery-independent monitoring programs; monitoring of settlement patterns; a review of the capacity goal of the restricted access program; expanded collaboration with industry with research and monitoring; and consideration of MPAs in urchin management. Interim measures could include a size limit, management zones, and annual quotas.

How MPAs May Help:

Reserves in northern California could improve red urchin density which would have two positive effects on the population. Fertilization success would be improved in this broadcast breeder (their sexual products are released into the ocean) because of larger aggregations of red urchins; and juvenile survival would be increased due to protection of the young by the increased availability of adult spine canopy. Reserves could also protect a portion of the large, fecund breeders of both sexes. This stable population would help provide insurance against years of poor recruitment and thus provide a stable base of spawning adults.

Red sea urchin densities are known to increase inside MPAs. In a study of red sea urchins in the San Juan Islands, Tuya et al. (2000) found that abundance and size were significantly affected by the presence of established marine reserves. They found 60 times more large urchins than small urchins within marine reserves in the San Juan Islands that have been closed to take since 1970.

In northern California red urchin populations are significantly denser inside MPAs compared with fished sites (Rogers-Bennett et al. In Prep.). Densities outside the reserves in some areas in the north are far below that needed for fertilization success (less than 0.2 per square meter at Fort Ross) which has been estimated to be 4 per square meter (Levitan et al. 1992). These low densities were measured in 1999 and 2000 despite a major red sea urchin recruitment event which resulted in high densities of legal size urchin inside the MPAs (greater than 5 urchins per square meter) (Rogers-Bennett et al. In Prep.).

In southern California reserves could protect the stability of the ecosystem by not allowing purple urchins to proliferate when their larger relative, the red urchin, was removed by the fishery. Fertilization success and juvenile survival could also be affected positively. Reserves could protect large, fecund urchins of both sexes.

Spiny lobster (*Panulirus interruptus*)

Status of the Population:

Population size is unknown for the California spiny lobster (Leet et al. 2001). Commercial landings have fluctuated through the years and are influenced by some factors that are independent of the health of the population (such as water temperature, oceanographic patterns, weather and the export market). The closed season protects egg-carrying and molting female lobsters. The size limit ensures that there will be several year classes of broodstock, even if all legal-size lobsters are caught each season. The escape port has been effective in reducing the capture and handling of juvenile lobster. The Department has had a commercial logbook system in place since 1973. Catch effort, the numbers of legal and short lobsters taken, number of traps fished, and depths where the traps are fished are required information on the logs. The consistent presence of lobsters under legal size is generally a good indicator of a healthy fishery and population (Leet et al. 2001).

Home Range/Migratory Patterns:

A large portion of the lobster population makes an annual offshore-onshore migration that is stimulated by water temperature. During winter months they are found offshore at depths of 50 feet or greater. In late March through May lobsters move into shallow, warmer on shore waters less than 30 feet. In late October and November declining water temperatures and storm surge will move the lobsters offshore again. The spiny lobster is a southern California species with the majority of the population found in rocky areas between Point Conception and Magdalena Bay, Baja California, Mexico.

Current Regulations:

The commercial spiny lobster trap fishery is restricted access with 246 permittees. The current capacity goal is 225 trappers. There is an annual lobster lottery for lobster crewmembers if any new permits are available. The closed season is mid-March through September, the opening being the first Wednesday in October for commercial and the first Saturday before that for recreational take. All traps must be marked with a buoy bearing a P and the permittee's license number, have lobster escape ports, and trap destruct devices. Logbooks are required. The minimum size of lobster is 3 1/4 inches carapace length for both commercial and sport take.

Recreational divers may only use their hands to take lobsters, and their bag limit is seven a day.

Current regulations appear to be effective at managing the lobster fishery and resource.

How MPAs May Help:

Reserves could protect the shallow surf grass beds that are the required nursery areas for juvenile lobster. Trophy-size lobster of both sexes, which are also the most fecund, are becoming scarce, and a network of reserves would protect these individuals and allow them to reproduce. The absence of these large adults also has ecosystem effects, as they are predators on species like mussels and urchins. Lobster have extremely long and complex larval stages. It is thought, based on plankton surveys and ocean currents, that most of the lobster settling in California are produced in Mexico. Thus it is unclear whether lobster within MPAs in California would add to the population outside MPAs.

California Corbina (*Menticirrhus undulatus*)

Status of the Population:

Population estimates have not been made for California corbina. Beach seine hauls along the open coast in the mid-1990s yielded slightly lower but similar numbers of corbina to those obtained during a similar study in the mid-1950s. In addition, angler catch-per-unit efforts during the 1980s and the 1990s were similar to those in the mid-1960s, although annual catch estimates were much lower in the 1990s than in the 1980s. Annual catch per unit effort generally increases following increases in water temperature, such as during El-Niño/Southern Oscillation events. The population appears to be sustaining itself under present catch levels.

Home Range/Migratory Patterns:

Very little is known about the home range and migratory patterns of corbina. Limited tagging studies indicate that corbina do not move around much and they have no discernible migratory pattern. The greatest distance traveled was 51 miles. However, there is speculation that they seek warmer water in the winter by moving south, into bays or perhaps offshore.

Current Regulations:

No commercial take is allowed. It has been illegal to take corbina with nets since 1909, and illegal to buy or sell them since 1915.

California corbina are reserved for the recreational fishery. The recreational daily bag limit for corbina is 10, and there is no size limit.

Although the population appears to be sustaining itself under current regulations, continued colder water in the Southern California Bight may result in a reduction of the local corbina population. The current daily bag limit of 10 fish per angler does not increase protection for this species since most anglers rarely catch five or more corbina per trip. Marine Recreational Fisheries Statistical Survey and anecdotal data indicate that many smaller, immature corbina are caught and kept by anglers. A size limit may help to ensure adequate numbers of sexually mature fish.

How MPAs May Help:

Due to limited knowledge regarding movements and other life history parameters, it is unclear how reserves would help corbina. Corbina are mostly found in groups of several individuals, with larger fish being more solitary. Reserves would need to encompass large shallow, sandy areas since most corbina are found in this habitat. However, this may not protect spawning individuals since it is believed that they spawn farther offshore.

Surfperches and Seaperches (Family Embiotocidae)

Annual commercial landings of surfperches have been highly variable. While the market for fresh "perch" fillets is relatively small, the total catch for the fishery was 49,000 pounds in 1999 (Leet et al. 2001). The Department did not distinguish between species in catch statistics until 1987, simply listing the category as surfperch. Currently, there is a large commercial fishery for various surfperches in southern California and a moderate fishery focusing on redbtail surfperch in northern California (Leet et al. 2001).

The sport fishery is enjoyed by anglers who fish for surfperch from piers, jetties, sandy beaches, and boats. The recreational catch of surfperch for 1999 totaled 489,000 fish, with the majority being caught in central and northern California (Leet et al. 2001). The average sport catch for 1993 through 1999 was 864,000 fish with a high of 1,119,000 fish in 1998 (Leet et al. 2001). Most of the California coastal species taken in the sport catch are taken when spawning aggregations are present. Female surfperches are intentionally targeted by sport anglers because they are larger than males (Leet et al. 2001). Sport anglers also grade their catch, which probably results in an even greater take of mature females, contributing to a decline in the fishery (Leet et al. 2001).

The redbtail and barred surfperches are the most notable in the commercial catch and may be important to local economies (Leet et al. 2001). Total commercial surfperch landings have fluctuated over the years, but over the long-term have declined by 25 percent since the 1950s (Leet et al. 2001). Recent research has indicated that some of the decline is associated with the increases in water temperature (Leet et al. 2001). Surfperch habitats have been, and will continue to be, areas of conflict. As humans develop the shoreline, areas inhabited by surfperches may become polluted or destroyed. Although surfperches may adapt to structures such as jetties and piers, it should not be assumed that they can continue to adapt to all the changes from human activities (Leet et al. 2001).

Barred Surfperch (*Amphistichus argenteus*)

Status of the Population:

During the last seven years, the sport fishery in southern California has yielded up to 306,000 barred surfperch (1998), while central and northern California together produced upwards of 252,000 fish annually. No estimates have been made of the size or current status of the barred surfperch population (Leet et al. 2001).

Home Range/Migratory Patterns:

Barred surfperch are found in small schools along sandy beaches and near jetties, piers, and other sources of food and cover. They range from Bodega Bay in northern California to north central Baja California.

Calico Surfperch (*Amphistichus koelzi*)

Status of the Population:

The mean sport catch from 1993 to 1999 was 16,000 fish. There is no targeted commercial catch, but small numbers are taken in the directed redbtail surfperch fishery. At this time, little information is available on the population status of the calico surfperch (Leet et al. 2001).

Home Range/Migratory Patterns:

The range of the calico surfperch is from north central Washington to northern Baja California. The primary habitat of the calico is sandy beaches, although they can occasionally be found over rocky substrate. The vertical distribution of the calico includes depths from the surface down to 30 feet.

Pile Perch (*Damalichthys vacca*)

Status of the Population:

Pile perch sustain a limited commercial fishery in Del Mar, California but do not contribute substantially to annual commercial landings in the state. They are of interest as a sport fish throughout the state, with an average of 16,000 perch caught between 1993 and 1999 (Leet et al. 2001). Because accurate landings data for pile perch are lacking, little can be concluded about the current population status in California.

Home Range/Migratory Patterns:

Pile perch are found between southeastern Alaska and northern Baja California, including Guadalupe Island. They usually live along rocky shores, from the surface down to 150 feet.

Redtail Surfperch (*Amphistichus rhodoterus*)

Status of the Population:

The annual commercial take averaged 37,000 pounds over the last 10 years, with a high catch in 1990 in excess of 62,000 pounds and a low catch of around 27,000 pounds in 1998. There are no estimates of the size of the redbtail surfperch stocks in California coastal waters. The commercial catch averaged 50,000 pounds during the 1970s, 48,000 pounds during the 1980s and 38,000 pounds during the 1990s, which suggests a decreasing population. Another indicator of problems with the population is the decrease in weight from an average per fish weight of 1.8 pounds during the late 1950s and early 1960s to 0.9 pounds during the 1990s (Leet et al. 2001). The sport catch since 1993 has ranged from a low of 10,000 fish in 1998 to a high of 56,000 in 1994.

Home Range/Migratory Patterns:

Redtail surfperch are found from Vancouver Island, Canada, to Monterey Bay, California, but the fishery is centered north of the San Francisco Bay area. They support a commercial fishery only in northern California, especially in the inshore waters of the Eureka/Crescent City area where over 99 percent of the catch is taken. These fish are taken primarily from sandy beaches or the mouths of rivers and streams entering the sea, but also can be caught from jetties and piers inside harbors and bays. The best catches are in March and April when the fish aggregate for spawning.

Rubberlip Seaperch (*Rhacochilus toxotes*)

Status of the Population:

The sport catch over the last seven years ranged from 13,000 fish in 1993 to 44,000 fish in 1997 with an average of 19,000. The commercial fishery is very small with landings of less than 1,000 pounds annually from southern California (Leet et al. 2001). No recent estimates have been made of the rubberlip perch population and its status is unknown at this time.

Home Range/Migratory Patterns:

Rubberlip surfperch are found from Russian Gulch State Beach (Mendocino County), California, to central Baja California, including Guadalupe Island. These fish range from inshore waters to depths of 150 feet.

Striped Seaperch (*Embiotoca lateralis*)

Status of the Population:

Striped seaperch is one of the eight to ten species that make up the small commercial "perch" fishery. However, it is a minor component when compared to such species as the barred or redbtail surfperch. Conversely, striped seaperch do comprise a substantial portion of the state's sport fishery. The mean take of striped seaperch for the last seven years was 65,000 fish, almost entirely from central and northern California. Population estimates of striped seaperch have not been made, but recent landing figures indicate that this species should be able to sustain a healthy sport catch (Leet et al. 2001).

Home Range/Migratory Patterns:

Striped seaperch are found from southeastern Alaska to northern Baja California.

Walleye Surfperch (*Hyperprosopon argenteum*)

Status of the Population:

The commercial take is very minor with less than 6,000 pounds being landed since 1984. The recent sport take has averaged 112,000 fish per year. However, the total stock size is unknown at this time.

Home Range/Migratory Patterns:

Walleye surfperch are found in large schools along sandy beaches, jetties, kelp beds and other habitats with rich invertebrate life. They range from Vancouver Island, British Columbia, to central Baja California, including Guadalupe Island (Leet et al. 2001). They are found from the surface to a depth of 60 feet.

Surfperches

Current Regulations:

The recreational bag and possession limit is 5 surfperch in combination of species. There is a 10 ½ inch minimum size limit on the sport take of redbait surfperch, and there is a closed season on the sport take of surfperch in San Francisco Bay and San Pablo Bay (bays) during the period April 1 through July 31, inclusive. However, during the closure in the bays, shiner surfperch may be taken and possessed under emergency regulations adopted during 2002 by the Commission. The Commission recently adopted the exemption to the closure in the bays for shiner surfperch on a permanent basis. Also, a requirement, that vessels entering the bays with surfperch aboard remain underway without fishing gear in the water until arriving at their home port or launch site was repealed through regulations adopted in June 2002 by the Commission.

Surfperch may be taken commercially only between July 16 and April 30 (season is closed from May 1 through July 15), except shiner perch may be taken at any time. Surfperch may be sold or purchased only between July 16 and May 10. South of Point Arguello, Santa Barbara County, barred, redbait, and calico surfperch may not be taken; however, during the open season for these species north of Point Arguello, these surfperch species may be shipped south of Point Arguello and sold if fish are individually tagged by the permanent attachment of tags as directed by regulations adopted by the Commission. There is no size limit for surfperch taken commercially.

How MPAs May Help:

Surfperch fecundity (the number of offspring produced by an individual female) increases with age and size. If the average size increases in a reserve then the reproductive potential would be greater. As live-bearers surfperch in general produce very few young. For species where fecundity is known, large females produce between 2 and 6 times as many offspring than younger, smaller, ones. In MPAs it would be

expected that more surfperch would be larger, thus significantly increasing the local reproductive output. This increase could lead to young surfperch replenishing nearby areas as they move out of the MPAs. Because some surfperch aggregate to spawn, MPAs in the appropriate locations could help protect spawning adults. This protection could provide for increased spawning success and thus more potential recruitment.

Crabs

Dungeness Crab (*Cancer magister*)

Status of the Population:

Dungeness crab populations in California have been fully exploited for at least 40 years and fishing intensity is extreme (Leet et al. 2001). In most years, between 80 to 90 percent of all available legal-sized male crabs are taken (Leet et al. 2001). Although such high exploitation rates on adult males might give rise to concerns that female mating success might be reduced as a consequence, recent studies have shown that essentially all molting females receive attention from males in northern California (Leet et al. 2001). Usually one, and no more than two year-classes of male crabs dominate annual landings. Thus, since about 1960, annual landings provide a reasonable notion of abundance of legal-sized males and also provide a strong signal of variation in year class strength of recruited crabs (Leet et al. 2001).

The dramatic decline in Dungeness crab catches in the central California fishery during the late 1950s focused considerable research attention on this resource during the 1970s. No definitive cause for the decline in the central California fishery has been established although researchers have assessed the possible effects of changes in ocean climate on survival and development of crabs eggs and larvae, the role of nemertean worm predation on egg survival, the effects of pollution on survival of juvenile crabs in San Francisco Bay, and possibly unstable internal population dynamics (Leet et al. 2001). Of these possible causes, a shift to warmer waters during and following the decline during the late 1950s seems the most plausible (Leet et al. 2001). If correct, the abundance of crabs in the central California fishery may improve over the next two decades if California coastal water temperatures remain cooler as a consequence of apparent ocean regime shifts (Leet et al. 2001). There seems little doubt that crab populations, with their extremely fecundities and vulnerable early larvae stages, are prone to large natural fluctuations in abundance. Variable oceanographic factors (temperature, wind, currents) have important impacts on survival (Leet et al. 2000)

Home Range/Migratory Patterns:

Dungeness crabs range from the Aleutian Islands to Point Conception. They prefer sandy to sandy-mud bottoms and can be found from the intertidal zone to depths of at least 750 feet but are most abundant in depths less than 300 feet. The resource off California consists of five subpopulations in the following areas: Avila-Morro Bay, Monterey, San Francisco, Fort Bragg and Eureka-Crescent City. Movement patterns by individuals of both sexes appear to be random with males moving more than females. At times, inshore or offshore migrations have been noted. Most movements are less than 10 miles, but some individuals have moved up to 100 miles. Dungeness crab larvae are planktonic for up to 125 days and go through six larval stages, first being transported offshore then onshore before transforming to the benthic adult stage.

Estuaries such as San Francisco and Humboldt Bays are important nursery areas for young crabs but, given the limited availability of such habitats, most Dungeness crabs develop and grow in nearshore coastal waters.

Current Regulations:

The commercial fishery is managed under a restrictive permit system which is generally open only to prior Dungeness crab permit holders and designed to eventually reduce the number of fishery participants. In 2001 there were 586 resident and 66 non-resident permittees which represents a decrease of 46 permits since the system was implemented in 1995. The fishery is closed from July 16 through November 30 north of Sonoma County and from July 1 through November 14 elsewhere. In addition, certain estuaries and areas near river mouths are closed to commercial take. Only male crabs with a minimum size of 6¼ inches carapace width may be taken. Traps must have at least two 4¼ inch diameter escape openings to allow females and undersize males to leave the trap. Traps must also be fitted with a destruct device to allow them to open and crabs to escape if the trap is lost or not retrieved. Incidental take by trawl vessels is prohibited south of Point Reyes and limited to 500 pounds north of that point. No vessel may take crabs for commercial and recreational purposes on the same day.

Recreational closed seasons are from August 1 to the Saturday before December 1 north of Sonoma County and from July 1 to the Saturday before the second Tuesday in November elsewhere. The general daily bag limit is 10 crabs per person with a minimum size limit of 5 ¾ inches carapace width. In Sonoma, Marin, San Francisco, San Mateo, Santa Cruz and Monterey counties when onboard a commercial passenger fishing vessel (CPFV), the daily bag limit is six crabs per person with a minimum size of 6 inches carapace width. In addition, no more than a total of 60 traps may be used by a CPFV to take crabs. San Francisco and San Pablo Bays from the Golden Gate Bridge to the Carquinez Bridge are closed to crab fishing.

Although Dungeness crab populations have produce landings that have fluctuated around a fairly stable long term mean for more than thirty years, current fishery regulations generally appear effective in maintaining the population at productive levels and the resource might be considered healthy. However, no formal fishery management plan or stock assessments have been produced for west coast population.

How MPAs May Help:

Establishing relatively large reserves in Dungeness crab habitat might result in higher overall abundances, larger individuals and the presence of more age classes, primarily for male crabs, as a result of the elimination of fishing pressure within those areas. Since crabs move randomly over moderate distances, some would be expected to become available to the fishery outside the reserves. Because crab larvae are planktonic and transported over large distances, most of those produced inside the reserves are expected to be exported to other areas. Whether more larvae would be

produced in the reserves is questionable since female crabs are already protected from take and more of the reserve population is likely to be composed of males. Since such reserves would protect other exploited species as well, the ecosystem functions of crabs might be altered as a result of more intense competition and predator/prey interactions. Similarly, reserves would also protect habitats valuable to Dungeness crabs from a variety of potential fishing activity related impacts.

Rock crabs: Brown rock crab (*Cancer antennarius*), yellow rock crab (*C. anthonyi*), and red rock crab (*C. productus*)

Status of the Population:

Information is not available on stock sizes, recruitment and mortality rates, the effects of different oceanographic regimes, or potential yield of rock crab populations (Leet et al. 2001). The commercial fishery, however, has had a localized effect on crab abundance and size (Leet et al. 2001). Fishing areas intensively exploited over an extended period show a lower catch-per-trap and a reduced size-frequency distribution compared to lightly exploited areas (Leet et al. 2001). In Santa Monica Bay, an area closed to commercial crab fishing for decades, experimental catch rates were higher, crab sizes larger and size-frequencies broader than in adjacent areas open to commercial trapping (Leet et al. 2001). Future research should be aimed at a better understanding of fishery-related rock crab population parameters.

Home Range/Migratory Patterns:

These three species have overlapping distributions with the yellow rock crab ranging from Humboldt Bay into southern Baja California, the brown rock crab from northern Washington to central Baja California and the red rock crab from Kodiak Island to central Baja California. All three species occur in depths from the low intertidal zone to over 300 feet. Yellow rock crabs prefer sandy or soft bottom habitat, while brown and red rock crabs appear to prefer rockier or reef type substrates. These species do not appear to migrate or undertake large-scale movements. Tagged crabs have moved several miles, but with no apparent patterns. The planktonic larvae undergo at least seven developmental stages before transforming to the adult stage and settling to the bottom.

Current Regulations:

A general trap permit is required to take rock crabs commercially. All crabs must be at least 4¼ inches in carapace width. Traps must have at least one 3¼ inch diameter escape opening to allow undersize crabs to leave the trap. Certain areas, primarily portions of Humboldt Bay, Santa Monica Bay, Catalina Island and San Pedro Bay, are closed to commercial rock crab fishing.

The recreational rock crab daily bag limit is 35 crabs, in combination of species, per person with a minimum size limit of 4 inches carapace width.

How MPAs May Help:

Establishing relatively large reserves in rock crab habitats could be expected to result in higher overall abundances, larger individuals and the presence of more age classes as a result of the elimination of fishing pressure within those areas. A large area closed to the commercial fishery has shown these characteristics. Since crabs may move randomly over moderate distances, some would be expected to become available to the fishery outside the reserves. Because crab larvae are planktonic and transported over relatively large distances, most of those produced inside the reserves are expected to be exported to other areas. More rock crab larvae may be produced in these reserves since both sexes of rock crabs are subject to take and are expected to be in higher abundance inside reserves. Since such reserves would protect other exploited species as well, the ecosystem functions of crabs might be altered as a result of more intense competition and predator/prey interactions. Similarly, reserves would also protect habitats valuable to rock crabs from a variety of potential impacts related to fishing activity.

California Halibut (*Paralichthys californicus*)

Status of the Population:

Abundance of larval California halibut in plankton surveys is correlated with commercial landings of halibut, suggesting that this species has a cycle of abundance approximately 20 years in length (Moser and Watson 1990). However, the size of the halibut population may be limited by the amount of available nursery habitat, as juvenile halibut appear to be dependent on shallow water bays as nursery areas. The overall decline in California halibut landings corresponds to a decline in shallow water habitats in southern California associated with dredging and filling of bays and wetlands (Kramer and Sunada 1992). The total California biomass of the halibut resource obtained from virtual population analysis (VPA) estimate in the late 1980s was 5.7 to 13.2 million pounds, with annual recruitment of fish at age one estimated to be between 0.45 and 1.0 million fish (Reed and MacCall 1988). The number of juvenile halibut emigrating from southern California bays to the open coast (age one) estimated from beam trawl surveys ranged between 250,000 and 400,000 in the late 1980s (Kramer 1990 and 1991). In the early 1990s, a swept-area trawl survey was conducted by the Department to better understand California halibut population dynamics. This fishery-independent survey produced a biomass and population estimate for halibut in southern and central California. The survey results indicated a halibut biomass of 6.9 million pounds for southern California and 2.3 million pounds for central California, while the population estimate was 3.9 million halibut for southern California, and 700,000 halibut for central California (Wertz 2001).

Home Range/Migratory Patterns:

California halibut are found in nearshore waters on the west coast of North America from Almejas Bay, Baja California Sur (Oda 1991), to the Quillayute River, Washington (Eschmeyer et al. 1983). They are most common south of Morro Bay, California (Fitch and Lavenberg 1971), with their distribution centered off northern Baja California (Moser and Watson 1990).

Bays and estuaries are thought to be nursery grounds for juvenile halibut less than eight inches, because they provide optimal habitat for growth and survival (Allen 1988; Allen and Herbinson 1990; Kramer 1990, 1991). The eventual migration of juvenile halibut greater than eight inches from bays to the open coast has been suggested to be the first significant movement of California halibut (Domeier and Chun 1995).

Halibut living in open coastal waters are associated with soft bottoms, sand dollar beds, kelp beds, and rocky relief extending offshore from the surf zone to 183 meters (Feder et al. 1974; Eschmeyer et al. 1983), although they are typically more abundant in waters less than 15 fathoms (Kramer and Sunada 1992; California Department Unpublished data).

Over the past four decades the Department has conducted extensive tag and release studies of California halibut. Tagging effort ranged geographically from Sebastian Vizcaino Bay, Baja California, north to Tomales Bay, California, with the primary effort centered between Oceanside and Point Conception (Young 1961; Domeier and Chun 1995). Results showed that halibut less than 20 inches remained relatively localized and traveled less than 2 miles, although halibut greater than 20 inches traveled greater distances. The average overall distance traveled was eight miles during the study period. Their results also indicated halibut movement was parallel to the coastline, and northward migrations were of significantly greater distances when compared to halibut traveling southward. However, tagged halibut recaptures south of the international boundary with Mexico may have gone unreported, limiting our knowledge of southward migrations.

Current Commercial Regulations:

Three principal gears are used to commercially catch California halibut: bottom trawl, set gill and trammel net, and hook-and-line. In general, commercial fishing regulations prohibit the sale of California halibut less than 22 inches total length, unless the weight is at least four pounds whole, 3.5 pounds dressed with the head on, or 3 pounds dressed with head off.

Bottom trawling is prohibited within the State's jurisdictional waters (0-3 nautical miles), except in the designated "California halibut trawl grounds," which encompass the area between Point Arguello and Point Mugu in waters greater than one nautical mile from shore. Trawls used in this area must have a minimum mesh size of 7.5 inches, and trawling is prohibited from March 15 to June 15, to protect spawning adults.

Set gill and trammel nets are prohibited within the States jurisdictional waters (0-3 nautical miles) in southern California from Point Arguello to the Mexican border, and in waters less than 70 fathoms or within one nautical mile, whichever is less, around the Channel Islands, including San Miguel, Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Catalina Island, and San Clemente Island. North of Point Arguello, depth restrictions on set gill nets varies by district. In a recent action by the Department to protect sea otters and seabirds, gill and trammel nets were prohibited from Point Arguello (Santa Barbara County) to Point Reyes (Marine County) in 60 fathoms or less. The minimum mesh size to take halibut is 8.5 inches.

No commercial hook-and-line gear may be used to take halibut in Fish and Game District 16 (waters south of a line drawn from Pt. Pinos, Monterey Bay, 100 degrees magnetic to the eastern shore), and no more than 30 hooks may be used per troll line to take California halibut in Districts 6, 7, and 10 (ocean waters from the Oregon border to Pigeon Pt.).

Current Recreational Regulations:

Recreational regulations also require a minimum size limit of 22 inches total length, in addition to a daily bag limit of five California halibut south of a line due west magnetic from Point Sur, Monterey County, and only three halibut per day when fishing north of a line due west magnetic from Point Sur, Monterey County. Fillets must be a minimum of 16-3/4 inches in length and must bear the entire skin intact. Halibut can be taken using hook-and-line, spear, or hand.

How MPAs May Help:

Current management measures for California halibut appear to be maintaining a sustainable fishery according to market receipt information, CPFV logbook data, and Recreational Fishery Information Network (RecFIN) data. However, marine reserves that encompass bays, estuaries, and lagoons would protect juvenile halibut and the habitat they require for growth and survival. Also, relatively narrow reserves that are positioned adjacent to the coastline out to 30 fathoms would protect the adult spawning population in southern California from increased fishing pressure from private boat owners and commercial hook-and-line fishermen.

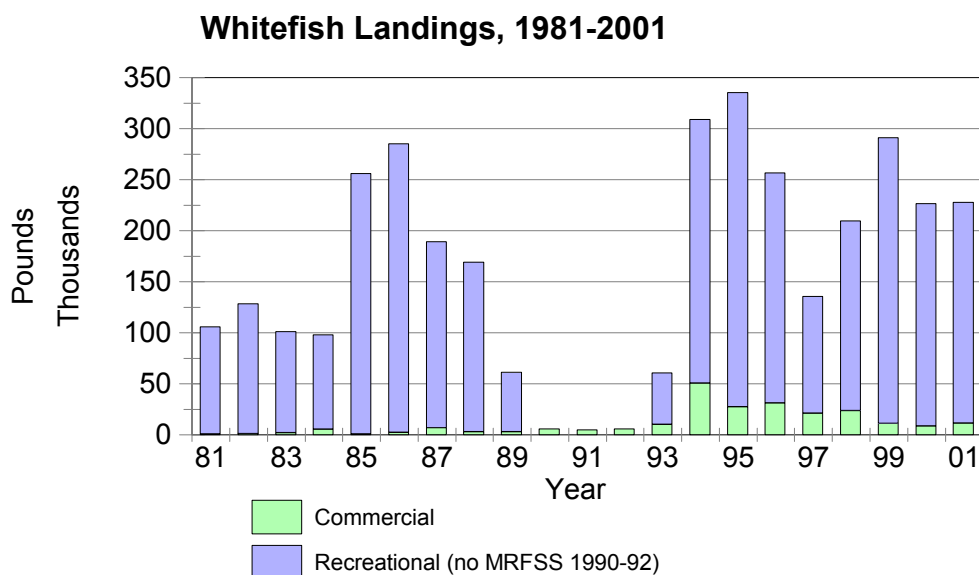
Ocean Whitefish (*Caulolatilus prince*s)

Status of the Population:

The status of the population of ocean whitefish off California, and throughout the center of the population to the south of California, is generally unknown. Ocean whitefish are not believed to be resident to California waters, based on catch patterns and the distribution of their eggs and larvae. The southern California population of ocean whitefish is thought to be derived from central and southern Baja California, Mexico (Leet et al. 1992).

During the period 1980 through 2001, the California sport catch of ocean whitefish ranged between 43,000 fish (1989) and 335,000 fish (1995). Estimates of the pounds of ocean whitefish taken annually by anglers averaged about 149,000 during the 1980s and 213,000 during the 1990s, making this species an important component of the sport catch (see graph below). Following the peak in sport caught ocean whitefish in 1995, catches ranged between 91,000 to 212,000 fish for the balance of the 1990s. The average size of sport caught ocean whitefish ranged from 1.87 pounds per fish (1983) to 0.75 pounds per fish (1993).

Commercial landings of ocean whitefish remained at less than 10,000 pounds during the period from 1981 through 1992, but increased to nearly 51,000 pounds during 1994. Commercial catches have since ranged downward from 31,000 pounds in 1996 to 8,756 pounds in 2000, about 5-15 percent of the sport take during recent years. Given the generally sustained sport catches of ocean whitefish in recent years, the cause of recent declines in commercial landings is uncertain, but may be related to changes in market demand and/or restrictions on associated shelf and nearshore fisheries.



Home Range Migratory Patterns:

Ocean whitefish are reported to range from Vancouver, British Columbia, to Peru and possibly Chile, and in the vicinity of the Galapagos Islands. Off California, ocean whitefish seldom occur north of Point Conception, Santa Barbara County. Ocean whitefish inhabit shallow waters over rocky-bottom and kelp-bed habitats from near the surface to a depth of 450 feet. Loosely aggregated schools of adults often are found at depths of 10 to 65 feet. Adults swim a few feet above the bottom, dropping down occasionally to the substrate to feed. Ocean whitefish are more abundant around offshore islands and banks than along the mainland coast.

Ocean whitefish are not known to be a migratory species. However, ocean whitefish eggs, larvae, and juveniles stages may be carried significant distances along the California and Baja California coasts by nearshore current systems. These currents carry the pelagic stages of ocean whitefish northward into areas where they are not normally resident, and may eventually produce outlying "colonies" of adult ocean whitefish. These fish may thrive and grow in the cooler northern waters, but their reproductive success may be greatly inhibited by the existing oceanic conditions.

Current Regulations:

There are no specific regulations for the commercial take of ocean whitefish. Ocean whitefish may not be taken or possessed while recreational fishing in waters 20 fathoms or greater in depth in the southern rockfish and lingcod management area during a southern rockfish and lingcod closure from November to January, and in waters 20 fathoms or greater in depth in the Cowcod Conservation Areas (two large areas south of Pt. Conception).

Ocean whitefish are governed by the general 10-fish daily bag and possession limit. All fillets shall be a minimum of six and one-half inches in length. Each fillet shall bear a one-inch square patch of skin. There is no recreational size limit.

How MPAs May Help:

Current information indicates that ocean whitefish do not sustain reproducing populations off California (reproduction occurs to the south of California). Resident adult ocean whitefish that do occur off California generally result from the transport of larvae and juveniles northward into our waters. No-take reserves would prohibit commercial and recreational ocean whitefish fisheries without the long-term benefit of helping to sustain a locally reproducing population of ocean whitefish. To the extent that ocean whitefish are resident within a marine reserve, a prohibition on take would reduce fishing mortality on these fish. This, in turn, may result in enhanced growth of these fish in reserves, and allow for natural interactions with other locally reproducing species, but would not result in any expected enhancement of ocean whitefish production in local waters.

Giant Kelp (*Macrocystis pyrifera*)

Status of the Population:

The size and distribution of giant kelp beds has fluctuated greatly during the past 30 years. Kelp canopies have generally declined since 1967, when the California Department conducted the first statewide survey documenting the size and distribution of kelp beds. Subsequent surveys in 1988 and 1999 found that kelp beds had declined statewide in each of those years compared to the 1967 level, with the greatest decline occurring along the mainland coast of southern California. This long term decline can be attributed to both natural disturbances such as warm water stress and intense storms associated with El Niños and human caused disturbances. These disturbances include increased turbidity and siltation associated with coastal development, pollution, and commercial and recreational fishing activities that remove animals such as California sheephead and California spiny lobster which may help sustain kelp forests through their trophic interactions.

Oceanographic conditions have been favorable for kelp growth during the past several years; relatively cool summer sea surface temperatures were followed by mild, dry winters with relatively few large swell events. These conditions have provided for strong recruitment and a general increase in canopy area for many beds, particularly those in southern California. The Department plans to conduct another statewide kelp survey in 2002.

Home Range/Migratory Patterns:

Giant kelp ranges from approximately Santa Cruz to southern Baja California, Mexico. The offshore edge of kelp beds in turbid waters usually occurs at depths of 50 to 60 feet, while in clear water around the Channel Islands of southern California, the offshore edge of the kelp bed may extend to more than 100 feet. Given favorable oceanographic and substrate conditions, giant kelp can occur and persist throughout the nearshore environment. Occurrences of giant kelp in California are frequently controlled by wave exposure and the availability of rocky substrate.

Current Regulations:

Commercial harvesters must possess a kelp harvesting license and pay a royalty on each wet ton of kelp harvested. Harvesters are not limited in the amount of kelp which may be harvested, however no kelp may be cut below 4 feet from the surface of the water (this protects the plant's reproductive structures which are located at the base of the plant). Department designated kelp beds may be exclusively leased for a period of up to 20 years, although harvesters may not lease more than 25 square miles or 50 percent of the total kelp resource (whichever is greater). Harvesters must report the weight of all kelp harvested by date and kelp bed number. Nine beds containing giant kelp are currently closed to commercial harvesting, and the Commission may

designate, through emergency regulation, any kelp bed or portion of a bed as a harvest control area where harvesting will be prohibited.

Recreational harvesters must possess a sport fishing license and may take no more than 10 pounds (wet weight) of giant kelp per day, except during the herring-ro-e-on-kelp season when 25 pounds may be harvested.

Under the current suite of regulations, the present level of harvesting is sustainable. In fact, from 1950 through 1980 the harvest appeared sustainable at levels nearly three times greater than those at present. Recent harvests are lower because the alginate industry has considerably reduced its demand for California kelp.

How MPAs May Help:

The long term decline in giant kelp has been linked to unfavorable oceanographic conditions, pollution, and habitat degradation (Foster and Schiel 1985). These factors are not likely to be affected by establishment of a reserve. Relatively large concentrations of sea urchins, perhaps a result of fewer predators, can also negatively impact kelp populations (North 1983, Tegner and Dayton 1991). Even so, reserves may benefit kelp by protecting species which feed on urchins such as California sheephead and spiny lobster that are the subject of intense directed fisheries. However, despite the protection offered to urchin predators in reserves urchins may still be more abundant in reserves than in adjacent areas subject to urchin harvest. Tegner and Dayton (1991) suggested that the commercial fishery for red sea urchins has helped to increase the long term stability of kelp off Point Loma. Other evidence suggests that the abundance may actually benefit kelp, by reducing the proportion of certain urchin species. In the Anacapa Island Ecological Reserve Natural Area the proportion of large red urchins to small purple urchins is higher than that in adjacent fished areas. Tegner and Dayton (1991) suggested that the commercial fishery for red sea urchins has helped to increase the long term stability of kelp off Point Loma.

Reserves may provide some benefit to portions of kelp beds which experience repetitive harvesting. Recently a small portion of a bed in Monterey County was closed due to a concern that certain plants were being negatively impacted by repetitive harvesting. Although much of the research involving the effects of harvesting on giant kelp have shown no negative long-term impacts, some studies have indicated that harvesting can reduce survivorship (Rosenthal et al. 1974) and that repetitive harvesting (defined as four or more harvests per year) can negatively impact yield (Brandt 1923).

Literature Cited:

- Allen, M.J., and K. Herbinson. 1990. Settlement of juvenile California halibut, *Paralichthys californicus*, along the coasts of Los Angeles, Orange, and San Diego Counties in 1989. California Cooperative Oceanic Fisheries Investigations Reports 31:84-96.
- Allen, L.G. 1988. Recruitment, distribution, and feeding habits of young-of-the-year California halibut, *Paralichthys californicus*, in the vicinity of Alamitos Bay-Long Beach Harbor, California, 1983-1995. Bulletin Southern California Academy of Science 87:19-30.
- Ally, J.R.R., D.S. Ono, R.B. Read and M. Wallace. 1991. Status of major southern California marine sport fish species with management recommendations, based on analyses of catch and size composition data collected on board commercial passenger fishing vessels from 1985 through 1987. Calif. Dept. Fish and Game, Marine Resources Division, Admin. Report. 90-2, May, 1991.
- Ault, J.S. And J.D. Demartini. 1987. Movement and dispersion of red abalone, *Haliotis rufescens*, in Northern California. Calif. Dept. Fish and Game. 73(4):196-213.
- Babcock, R., and J. Keesing. 1999. Fertilization biology of the abalone *Haliotis laevis*: laboratory and field studies. Canadian Journal of Fisheries and Aquatic Sciences. 56:1668-1678.
- Beers, I and R. Ambrose. In Preparation. Southern California no-take marine reserves enhance target fish populations.
- Bohnsack, J.A. 1998. Marine reserves: lessons from Florida. In M.M. Yoklavich, ed. Marine harvest refugia for West Coast rockfish: a workshop. NOAA-TM-NMFS-SWFSC-255. Pp. 89-99.
- Brandt, R.P. 1923. Potash from kelp: early development and growth of giant kelp, *Macrocystis pyrifera*. U.S. Dep. Agr. Bull. 1191. 40 p.
- Campbell, A. (Editor). 2000. Workshop on rebuilding abalone stocks in British Columbia. Can Spec. Publ. Fish Aquat. Sci. 130: pp. 150.
- Carlton, J.T., J.B. Geller, M.L. Reaka-Kudla and E.A. Norse. 1999. Historical extinctions in the sea. Annu. Rev. Ecol. Syst. 30:515-538.
- Cox, K.W. 1962. California abalones, Family Haliotidae. Calif. Dept. Fish and Game, Fish Bull. 118:1-133.
- Davis, G.E., P.L. Haaker, and D.V. Richards. 1998. The perilous condition of the white abalone, *Haliotis sorenseni*. J. Shell. Res. 17:871-875.

- Davis, G.E. 2000. Refugia based strategies to restore and sustain abalone *Haliotis* spp. Populations in southern California. Can Spec. Publ. Fish Aquat. Sci. 130:133-138.
- Domeier, M.L., and C.S.Y. Chun. 1995. A tagging study of the California halibut, *Paralichthys californicus*. California Cooperative Oceanic Fisheries Investigations Reports. 36:204-207.
- Dugan, J.E. and G.E. Davis. 1993. Applications of marine refugia to coastal fisheries management. Can. J. Fish. Aquatic. Sci. 50:2029-2042.
- Eschmeyer, W.N., E.S. Herald, and H. Hammann. 1983. A field guide to Pacific Coast fishes of North America. Houghton Mifflin Co., Boston, Massachusetts, USA.
- Feder, H.M., C.H. Turner, and C. Limbaugh. 1974. Observations on fishes associated with kelp beds in southern California. California Department of Fish and Game, Fish Bulletin 160. 138 p.
- Fitch, J.E., and R.J. Lavenberg. 1971. Marine food and game fishes of California. University California Press, Berkeley, Ca. 179 p.
- Foster, M.S. and D.R. Schiel. 1985. The ecology of giant kelp forests in California: a community profile. Biological Report 85 (7.2). United States Fish and Wildlife Service. 152 p.
- Geiger, D.L. 1999. Distribution and biogeography of the recent Haliotidae (Gastropoda: Vetigastropoda) world-wide. Bollettino Malacologico 35:5-12.
- Halpern, B. In press. The impact of marine reserves: does size matter? Ecol. App.
- Hamm, DE, and R.S. Burton. 2000. Population genetics of black abalone, *Haliotis cracherodii*, along the central California coast. J. Exp. Mar. Biol. Ecol. 254:235-247.
- Hines, A.H, and J.S. Pearse. 1982 Abalone, shells, and sea otters: dynamics of prey populations in central California. Ecology 63:1547-1560
- Hobday, A.J., M.J. Tegner, and P.L. Haaker. 2001. Over exploitation of a broadcast spawning marine invertebrate: Decline of the white abalone. Rev. Fish. Biol. and Fisheries. 10:493-514.
- Johnson, D.R., N.A. Funicelli, and J.A. Bohnsack. 1999. Effectiveness of an existing estuarine no-take fish sanctuary within the Kennedy Space Center, Florida. North Am. J. Fisheries Management.

- Karpov, K. A., D. P. Albin, and W. H. Van Buskirk. 1995. The marine recreational fishery in northern and central California: a historical comparison (1958-86), Status of stocks (1980-86), and effects of changes in the California Current. Calif. Dept. Fish and Game, Fish Bull. 176, 192 p.
- Karpov, K.A., P.L. Haaker, D. Albin, I.K. Taniguchi, and D. Kushner. 1998. The Red abalone, *Haliotis rufescens*, in California: Importance of depth refuge to abalone management. J. Shellfish. Res. 17(3):863-870.
- Kojima, H. 1981. Mortality of young Japanese black abalone *Haliotis discus discus* after transplantation. Bull. Jap. Soc. Sci. Fish. 47:151-159.
- Kramer, S.H. 1990. Distribution and abundance of juvenile California halibut, *Paralichthys californicus*, in shallow waters of San Diego County. In C.W. Haugen, editor. The California halibut, *Paralichthys californicus*, resource and fisheries. California Department of Fish and Game, Fish Bulletin 174. Pp. 99-126
- Kramer, S.H. 1991. The shallow-water flatfishes of San Diego County. California Cooperative Oceanic Fisheries Investigations Reports 32:128-142.
- Kramer, S.H., and J.S. Sunada. 1992. California halibut. In W.S. Leet, C.M. Dewees, and C.W. Haugen, editors. California's living resources and their utilization, University California, Davis, California Sea Grant, Davis, California. UCSGEP-96-12. Pp 94-97
- Leighton, D.L. 1972. Laboratory observations on the early growth of abalone, *Haliotis sorenseni*, and the effect of temperature on larval development and settling success. Fish. Bull., U.S. 70:373-381.
- Leet, W.S., C.M. Dewees, and C.W. Haugen (eds.). 1992. California's Living Marine Resources and Their Utilization. California Sea Grant Extension Program. Department of Wildlife and Fisheries Biology. University of California, Davis, CA. 257 pp.
- Leet, W.S., C.M. Dewees, R. Klingbeil, and E.J. Larson (eds.). 2001. California's Living Marine Resources: A Status Report. The Resources Agency, California Department of Fish and Game. 592 pp.
- Love, R.M. 1991. Probably more than you want to know about the fishes of the Pacific coast. Really Big Press, Santa Barbara, California. Pp. 158-160.
- Love, M.S., A. Brooks, D. Busatto, J.S. Stephens Jr. and P.A. Gregory. 1996. Aspects of the life histories of the kelp bass (*Paralabrax clathratus*) and barred sand bass (*P. Nebulifer*) from the southern California Bight. U.S. Fish. Bull. 94:472-481.

- McShane, P.E. 1992. Early life history of abalone: a review. *In* S.A. Shepherd, M.J. Tegner, and S. Guzman Del Proo., editors. *Abalone of the World: Biology, Fisheries and Culture*. Blackwell Scientific.
- Miller, D.J. and D. Gotshall. 1965. Ocean sportfish catch and effort from Oregon to Point Arguello, California. Calif. Dept. Fish and Game, Fish Bull 130. 135 p.
- Morse, A.N.C., C. Froyd, and D.E. Morse. 1984. Molecules from cyanobacteria and red algae that induce larval settlement and metamorphosis in the mollusc *Haliotis rufescens*. Mar. Biol. 81:293-8.
- Moser, G.H., and W. Watson. 1990. Distribution and abundance of early life history stages of the California halibut, *Paralichthys californicus*, and comparison with the fantail sole, *Xystreurys liolepis*. *In* C.W. Haugen, editor. *The California halibut, Paralichthys californicus, resource and fisheries*. California Department of Fish and Game, Fish Bulletin 174. Pp. 31-71.
- Murawski, S.A., R. Brown, H.L. Lai, P.J. Rago, and L. Hendrickson. 2000. Large-scale closed areas as fishery-management tool in temperate marine systems: The Georges Bank experience. Bull. Mar. Science. 66(3):775-798.
- Murray, S.N., T.G. Denis, J.S. Kido and J.R. Smith. 1999. Human visitation and the frequency and potential effects of collecting on rocky intertidal populations in southern California marine reserves. California Cooperative Oceanic Fisheries Investigations Reports. 40:100-106.
- National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems*. National Academy Press. Washington D.C. 272 pp.
- North, W.J. 1983. The sea urchin problem. *In* W. Bascom, editor. *The Effects of Waste Disposal on Kelp Communities*. Southern California Coastal Water Research Project, Long Beach, California. Pp. 147-162.
- Oda, D. 1991. Developement of eggs and larvae of California halibut *Paralichthys californicus* and fantail Sole *Xystreurys liolepis* (Pisces: Paralichthyidae). Fishery Bulletin, U.S. 89:387-402.
- Oliphant, M.S., P.A. Gregory, B.J. Ingle and R. Madrid. 1990. California marine fish landings for 1977-1986. Calif. Dept. Fish and Game, Fish Bull. 173.
- Paddack, M.J. and J.A. Estes, 2000. Kelp forest fish populations in marine reserves and adjacent exploited areas of central California. Ecological Applications, 10:855-870.

- Palsson, W.A. 1998. Monitoring the response of rockfishes to protected areas. *In* M. M. Yoklavich, editor. Marine harvest refugia for West Coast rockfish: a workshop. NOAA-TM-NMFS-SWFSC-255. Pp. 64-73.
- Palsson, W.A. And R.E. Pacunski. 1995. The response of rocky reef fishes to harvest refugia in Puget Sound. Proceedings: Volume 1: Puget Sound Research '95. Puget Sound Water Quality Authority, Olympia, Washington, U.S.A.
- Paddack, M.J. 1996. The influence of marine reserves upon rockfish populations in central California kelp forests. Master's Thesis, University California, Santa Cruz. 40 pp.
- Parrish, R. 1999. Marine reserves for fisheries management: why not. California Cooperative Oceanic Fisheries Investigations Report. 40:77-86.
- Parrish, R., J. Seger, and M. Yoklavich. 2001. Marine Reserves to Supplement Management of West Coast Groundfish Resources: Phase I Technical Analysis. A report of the Pacific Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award Number NA17FC1048. 63 pp.
- Prince, J.D., T.L. Sellers, W.B. Ford and S.R. Talbot. 1987. Experimental evidence for limited dispersal of haliotid larvae (genus *Haliotis*; Mollusca: Gastropoda) J. Exp. Mar. Ecol. 106:243-263.
- Reed, R.R. and A.D. MacCall. 1988. Changing the size limit: How it could affect California halibut fisheries. California Cooperative Oceanic Fisheries Investigations Reports 29:158-166.
- Roberts, C.M., J.A. Bohnsack, F. Gell, J.P. Hawkins and R. Goodridge. 2001. Effects of Marine Reserves on Adjacent Fisheries. Science. 294:1920-1923.
- Roberts, C.M. and J.P. Hawkins 1999. Extinction risk in the sea. TREE 14:241-246.
- Rogers-Bennett, L., P.L. Haaker, K.A. Karpov and D.J. Kushner. In Press. Using spatially explicit data to evaluate Marine Protected Areas for abalone in southern California. Conservation Biology.
- Rogers-Bennett, L. and J.S. Pearse. 2001. Indirect benefits of Marine Protected Areas for juvenile abalone. Conservation Biology. 15:642-647.
- Rosenthal, R.J., W.D. Clarke, and P.K. Dayton. 1974. Ecology and natural history of a stand of giant kelp, *Macrocystis pyrifera*, off Del Mar, California. Fisheries Bulletin 72(3):670-684.

- Stephens, J. 2001. California Sheephead. *In* W.S. Leet, C.M. Dewees, R. Klingbeil, and E.J. Larson, editors. Californias Living Marine Resources: A Status Report. Pp. 155-156.
- Shepherd, S.A., and J.A. Turner. 1985. Studies on southern Australian abalone (Genus *Haliotis*). VI. Habitat preference, abundance, and predators of juveniles. *Jour. Exp. Mar. Biol. Ecol.* 93:285-298.
- Tegner M.J. 1989. The California abalone fishery: production, ecological interactions, and prospects for the future. *In* J.F. Caddy, editor. *Marine Invertebrate Fisheries: Their Assessment and Management*. J. Wiley and Sons.
- Tegner, M.J. 1993. Southern California Abalones: Can Stocks be Rebuilt Using Marine Harvest Refugia? *Can. J. Fish. Aquat. Sci.* 50:2010-2018.
- Tegner, M.J. and P.K. Dayton. 1977. Sea urchin recruitment patterns and implications of commercial fishing. *Science* 196:324-326.
- Tegner, M.J. and P.K. Dayton. 1991. Sea urchins, El NiZos, and the long term stability of southern California kelp forest communities. *Marine Ecology Progress Series*. 77:49-63.
- Tegner, M.J., J.D. Martini, and K.A. Karpov. 1992. The California red abalone fishery: a case study in complexity. *In* S.A. Shepherd, M.J. Tegner, and S.A. Guzmán del Prío, editors. *Abalone of the world*. Blackwell Scientific Publications, Oxford. pp. 370-383.
- Thomas, J.C. 1968. Management of the white seabass (*Cynoscion nobilis*) in California waters. *Calif. Dept. Fish Game, Fish Bull.* 142:1- 34.
- Tutschulte, T.C. 1976. The comparative ecology of three sympatric abalones. Ph.D. Dissertation. University of California, San Diego, CA.
- Tutschulte, T.C. and J.H. Connell 1988. Growth of three species of abalones (*Haliotis*) in southern California. *Veliger* 31:204-213.
- Wallace, S.S. 1999. Evaluating the effects of three forms of marine reserve on northern abalone populations in British Columbia, Canada. *Conservation Biology* 13:882-887.
- Walters, C. and J.J. MacGuire. 1996. Lessons for stock assessment from the northern cod collapse. *Rev. Fish Biol. Fisheries.* 6:125-137.
- Watling, L. and E.A. Norse. 1998. Disturbance of the seabed by mobile fishing gear: a comparison with forest clearcutting. *Conserv. Biol.* 12:1180

- Wertz, S. 2001. California halibut. *In* W.S. Leet, C.M. Dewees, R. Klingbeil, and E.J. Larson, editors. California's living marine resources: a status report. California Department of Fish and Game, 2001. pages 195-197.
- Yoklavich, M., H.G. Greene, G. Cailliet, D. Sullivan, R. Lea, and M. Love. 2000. Habitat associations of deep-water rockfishes in a submarine canyon: an example of a natural refuge. *Fishery Bulletin*. 98:625-641.
- Young, P.H. 1962. California halibut investigation. *In* D.S. Gorsline, editor. Proceedings of the first national coastal and shallow water research conference, October 1961. Tallahassee, Florida, USA. Pages 623-625

Appendix 7

Response to Report on Marine Reserve Proposals
for the Channel Islands National Marine Sanctuary,
Exhibit E.1.c., Supplemental SSC Report, September 2001

Dr. Vernon R. (Bob) Leeworthy
Peter Wiley

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Special Projects Office
Silver Spring, Maryland



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
~~Office of Special Resources, Cultural Values and Assessment~~
Silver Spring, Maryland 20910

AUG 5 2002

Mr. John Ugoretz
CA Dept. of Fish and Game
1933 Cliff Dr., Suite 9
Santa Barbara, CA 93109

John
Dear Mr. Ugoretz:

Please find enclosed a copy of our responses to the Pacific Fishery Management Council, SSC Marine Reserves Subcommittee's "Questions, Comments and Suggestions" for our "Socioeconomic Impact Analysis of Marine Reserve Alternatives for the Channel Islands National Marine Sanctuary".

For some reason a decision was made by the Pacific Fishery Management Council, SSC Marine Reserves Subcommittee to not include our responses to their questions, comments and suggestions even though we sent it in time for them to include them in their review of our report. Since your CEQA document relies on our report, we thought you should have a copy of our responses.

As you will see from our responses, you need not change anything in your CEQA document based on the Pacific Fishery Management Council, SSC Marine Reserve Subcommittee report.

If you have any questions, you can reach me at (301) 713-3000 ext. 138 or e-mail at Bob.Leeworthy@noaa.gov.

Sincerely,

Bob Leeworthy
Chief Economist
NOAA/NOS/Special Projects

/enclosure

cc: CINMS- Matt Pickett
CINMS - Sean Hastings



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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Special Projects Office
Silver Spring, Maryland 20910

MEMORANDUM FOR: Pacific Fishery Management Council
SSC Marine Reserves Subcommittee

FROM: Dr. Vernon R. (Bob) Leeworthy
Peter C. Wiley
NOAA/NOS/Special Projects

SUBJECT: Responses to questions and comments on "Socioeconomic Impact Analysis of Marine Reserve Alternatives for the Channel Islands National Marine Sanctuary", April 29, 2002.

A. Questions and Responses

Question 1. In the Net Assessment, where did the \$8 million commercial fishing consumer's surplus estimate come from?

Response 1. See pg. 108 "Commercial Fishing and Kelp".

Question 2. Were there specific studies that the \$3, \$5, and \$10 in non-use values came from or were they a range of estimates from the Desvousges and Carson papers?

Response 2. See pg. 102 "What we know about nonuse economic values".

Question 3. What were the source(s) of the multipliers used in the recreation industry analyses?

Response 3. They were simply a range of multipliers taken from our experience. They are Keynesian type multipliers, which are not the same as sectoral multipliers that would be found in the U.S. Department of Commerce's Regional Information Management System (RIMS) or in the IMPLAN input-output models. The counties of Los Angeles, Ventura and Santa Barbara are relatively large and diverse economies and the multipliers used are at the upper range of County Keynesian type of multipliers from our experience. The range of multipliers is also important (See Appendix II) because of the lack of more detailed estimates on the amount of activity by residents of each county versus nonresidents of each county relative to the County of access.

Question 4. Were commercial fishing logbooks used?

Response 4. Generally the answer is no. In the beginning of the project, we attempted to obtain logbooks for the commercial fisheries. We found out that not all the fisheries had a logbook requirement and for those that did, the California Department of Fish and Game (CDFG) neither had a master list of who maintains which logbooks, but also that there were no standards for how information was maintained. Some maintained electronic databases others simply had information in paper files (not necessarily organized in any fashion for public consumption). Our contractor, Dr. Craig Barilotti, did obtain urchin logbooks and the information contained in them was used to check the data against what we obtained from the fishermen

directly with respect to distribution of catch. The squid logbook forms were shown to us by the squid fishermen early in the project, but they were not yet implemented.

Question 5. How were the consumer's surplus estimates for recreation derived?

Response 5. Sent to you by e-mail from Pete Wiley early on Friday 6/14/2002. The question was how the person trip estimates in Wegge et. al. were translated to person days estimates. The answer is that they were divided by the mean number of days per trip found on page 30 (third paragraph up from the bottom).

B. Comments and Responses

Comment 1. It is wrong to use price elasticity of demand as a proxy for quality elasticities of value as was done for the Step 2 analysis of non-consumptive recreation. This coupled with the fact that the estimates of quality elasticity are arbitrary made these benefits meaningless.

Response to Comment 1. We know it is not technically correct to use price elasticities of demand for quality elasticities of demand. The former represent movements along a demand curve and the latter represent shifts in the demand curve. In our application, the quality elasticities are not technically quality elasticities of demand, but instead quality elasticities of consumer's surplus. We should have cited Freeman (1995). What we found was that the range of price elasticities from the literature on recreation demand was not different from the quality elasticities found in Freeman (1995).

The Freeman (1995) study covered marine recreation. Most were fishing studies with a few beach, boating or swimming studies, and the quality parameters were mostly catch rate or water quality. (See A. Myrick Freeman III, 1995, The Benefits of Water Quality Improvements for Marine Recreation: A Review of the Empirical Evidence. Marine Resource Economics, Volume 10, pp 385-406.). We should have cited this study instead of the study on price elasticities.

There are few studies available with quality elasticities but we would argue that our estimated range of quality elasticities is not arbitrary. They do reflect a reasonable range of values for policy simulation and do provide useful information about the possible magnitude of potential benefits to a particular user group.

Comment 2. The non-use value estimates found in the net assessment table (Table 3.29 on page 109 of your report) are not based on proper benefits transfer techniques. The studies in Desvousges were not marine resources and Carson has said that a change in the resource being valued or even the way the question is stated may have large impacts on the estimate.

Response to Comment 2. First, your comments on proper benefits transfer techniques. You are going to have to back that up. I have organized two National Workshops on the topic of "Benefits Transfer" with the Association of Environmental and Resource Economists (AERE). The latter one was a formal follow-up to the first. "Benefits Transfer: Procedures, Problems, and Research Needs", 1992 Association of Environmental and Resource Economics Workshop, Snowbird, Utah, June 3-5, 1992. I have also assisted the U.S. Forest Service by teaching "Benefits Transfer" procedures to Forest managers (National Workshop on Obtaining Recreation Values and Economic Impacts, Chattanooga, TN, March 10-12, 1998). Our workshops both preceded and followed the special issue of Water Resources Research, Volume 28, Number 3, March 1992 devoted to benefits transfer. The conclusion from these workshops is that the profession is divided and could not come to consensus on a set of protocols and procedures. Several authors have presented sets of protocols and procedures, but they were not generally accepted. Most still fall back on professional judgement.

There are issues such as transferring values of functions (no consensus) or calibration (adjusting for various methods—direction and scale of adjustment coming from meta analyses). Again, no consensus. And, an important point is that these issues dealt with studies where use values were at issue. There has been very little attention given to transfer of nonuse values.

Second, you say the studies in Desvousges were not marine resources. What evidence do you have that nonuse values for marine resources, especially the range from the lowest end of the distribution of values, would be any different from those from non-marine resources. There is none. In fact, we say there are no known studies of nonuse or passive economic use value for marine reserves (see pg. 101, Nonuse of Passive Use Economic Value).

Third, you cite Richard Carson as saying that a change in the resource being valued or even the way the question is stated may have large impacts on the estimate. The statement is completely irrelevant. It is the same fact that the panel hired by Exxon used in attacking the estimates for nonuse value lost by the Exxon-Valdez Oil Spill. That panel attacked the contingent valuation method in general and especially its use in estimating nonuse values. The NOAA Blue Ribbon Panel countered their findings. However, what you are implying is that any estimate that has wide variance is not useable. Many economists have found that the demand for any good or service can have wide variation depending upon functional form of the estimating equation or a host of other econometric issues. This doesn't make econometric estimates unusable. Many have found that prices for the same goods and services in the same markets have wide variation. Your point about the possibility of wide variation in any estimates of value are irrelevant, it applies in almost all cases.

Our choice of \$3, \$5, and \$10 was taken from the low end of the distribution of values from 19 studies of nonuse value in the literature. We argue that this biases the analysis against nonusers and we call these "conservative" estimates (see explanation on pg. 102 "What we know about nonuse economic values). We also use a very "conservative" (i.e., lower bound) estimate of the percent of U.S. households that might be willing to pay these amounts. We use some National Surveys that would lend some support to our contention, as well as the fact that the Exxon-Valdez number were applied to 90 percent of the U.S. households and we were only applying the estimates to one (1) percent of U.S. households.

Our nonuse value estimates again apply a reasonable lower bound range of values for policy simulation and in our application, we find that even when biasing values upwards in favor of consumptive uses and downwards for nonusers and non-consumptive users, there would be Net National Benefits for marine reserves in the Channel Islands National Marine Sanctuary. We stand by that conclusion.

Comment 3. In your Step 2 analyses, you use the terms likelihood and low/high probability without statistical basis to back these claims up.

Response to Comment 3. We don't believe either of these two terms are in anyway restricted for use to only when one has a specific quantitative estimate based on a particular statistical procedure. All our statements in Step 2 analysis are based on our judgement bringing together quantitative information and qualitative information. Our judgements may not find consensus among all on the Socioeconomic Panel. When speculating on the future (short or long run) there is uncertainty and different judgements cannot either be proved or disproved. See our discussion in the Introduction to our report (page 1).

C. Suggestions and Responses

Suggestion 1. On page 5 of the report, last paragraph under the heading "Commercial Fishing and Kelp Harvesting", you say "It is not always true that there will even be short-term losses (Leeworthy, 2001a)". Put in example from Tortugas.

Response to Suggestion 1. We cite the report with the findings for the Tortugas. If someone wants to go check out the details they can access the report.

Suggestion 2. Speculate about what other activities (i.e., other fisheries) that displaced fishermen might engage if displaced.

Response to Suggestion 2. We showed that the commercial fishing in the Channel Islands National Marine Sanctuary can be characterized as a multi-species fishery. We have no idea how fishermen will reallocate effort across either species or space after being displaced. This is the noted weakness in the current state-

of-the-art in modeling (i.e., empirical applications of the Sanchirico and Wilen models and beyond). The only approaches available would be direct interview approaches asking the fishermen to say how they think they would change their behavior with respect to each of the proposed alternatives. Without some kind of additional research, we would not have any basis for such speculation.

Suggestion 3. Estimate percent dependence on the Channel Islands for the population of fishermen in addition to your sample.

Response to Suggestion 3. As we have noted in the report, our sample is not a representative sample of all fishermen. It is biased towards the fishermen that account for most of the catch and value of catch. One cannot extrapolate to the general population of fishermen on the issue of dependence with this sample data. One can only get an idea of the extent of potential impact based on dependence with our sample. See tables 2.26 to 2.29.

Suggestion 4. Estimate the potential loss of effort in addition to loss of ex vessel value. Look into PacFIN data to see if it would support it.

Response to Suggestion 4. This would require implementation of the Sanchirico and Wilen type models. We don't think this is possible at this time. We have reviewed all the fishery management plans and the literature on implementing such models and we find very little in the way of bioeconomic models or reliable catch-effort relationships for any fishery in the Channel Islands or elsewhere in California. The real issue is what will happen to displaced effort. See response to Suggestion 2 above. We attended the North American Fishery Economists meeting in New Orleans April 2001. Jim Wilen gave a presentation on the bioeconomic spatial model for predicting effort allocation as a result of hypothetical marine reserves for red urchins in Northern California. Jim concluded that even in the simple case of red urchins in Northern California (simple oceanography characterized by north to south current flow) model could only yield qualitative results about what happens to total effort and how effort would be reallocated. Quantitative estimates thought not to be reliable (current state-of-the-art). The Channel Islands have a much more complex oceanography. Also, the dominant fishery in the Channel Islands is for market squid. The latest report we reviewed with attempts to estimate fishery stocks from catch statistics were not very successful. This is an area that needs a lot of research and is certainly beyond the scope of our effort.