CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE: PROPOSED CONTENTS OF THE DRAFT MASTER PLAN FRAMEWORK

Executive Summary

[To be prepared upon the completion of a draft master plan framework.]

Introduction

The rich natural heritage of California has supported commercial and recreational fisheries, which have provided consumers with a healthy source of high-quality protein, recreational anglers with a unique experience, and many coastal communities with sources of employment and revenues. California's nearshore waters have become among the top destinations for sport divers from around the world. Whether watching the flight of birds or the graceful forms of dolphins and whales, Californian's also have increasingly sought enjoyment from observing marine wildlife. The dramatic growth of marine aquaria along the coast also serves as evidence of growing public interest in ocean wildlife, while California's century-long renown as a leader in marine science has only grown. California is blessed with beautiful and productive marine resources.

In 1999, the State of California adopted the Marline Life Protection Act (MLPA), one in a long history of statutes and regulations designed to protect California's ocean and estuarine waters and the species and habitats found within them (FGC Section 2851-2863). The Department of Fish and Game is required to prepare and present to the Fish & Game Commission a Master Plan that will guide the adoption and implementation of the Marine Life Protection Program (FGC Section 2855[b]1). The Commission is required to adopt a master plan, based on the best readily available science, which includes recommendations for a statewide network of marine protected areas (FGC Section 2855[a]).

Another important law, the Marine Managed Areas Improvement Act (Public Resources Code, Sections 10900 et seq.), was adopted in 1998. The two measures, taken together, represent a very strong state policy declaration that California intends to protect its oceans and the marine species that live there.

Adding extra significance, on October 18, 2004, Governor Arnold Schwarzenegger announced an Ocean Action Plan (citation). One part of this Action Plan is the work of the MLPA Blue Ribbon Task Force and full implementation of the MLPA. These are but the latest in California's growing efforts to ensure protection and long-term conservation, use, and enjoyment of its living marine resources.

Early Years

From its very first days as a state in 1850, California has adopted statutes and regulations dealing with the ocean, fisheries and protection of resources, commerce and industry. In an historic sense, California's history of involvement (as with most other states) has been through early steps to regulate fishing and define health and safety requirements for those who earn a living on the waters, to protection and preservation of unique areas and features along the California coastline and in state waters. The third bill

adopted in the First Session of the California Legislature recognized and regulated the Bay Pilots, the professionals who to this day, guide commercial ships into San Francisco Bay.

In the early decades of statehood, California's policy toward natural resources reflected the desire of government at all levels to promote economic expansion by bringing natural resources into production (McEvoy 1986). Even so, lawmakers in California, as elsewhere, began becoming concerned that the expansion of fishing might well threaten the long-term economic health of the fishing industry. In 1852, the Legislature passed its first fishing statute to regulate the Sacramento River salmon fishery, and continued to do so over the next several decades. In 1870, the Legislature responded to the concerns of sport fishermen by establishing a State Board of Fish Commissioners, which later became today's Fish and Game Commission. In this, and other ways, California led the Nation. By the end of the 19th century, the California Legislature had adopted a body of fisheries management law that was a model for its time.

At the same time, the courts repeatedly upheld the importance of the state's role in protecting its resources. In 1894, for instance, the California State Supreme Court found as follows: "The wild game within a state belongs to the people in their collective, sovereign capacity; it is not the subject of private ownership, except in so far as the people may elect to make it so; and they may, if they see fit, absolutely prohibit the taking of it, or any traffic or commerce in it, if deemed necessary for its protection or preservation, or the public good."

Californians who fish often feel strongly about both available fisheries and regulations on access. Some assert that Article 1, Section 25, of the California Constitution seems to give the public a "right to fish." It states "The people shall have the right to fish upon and from the public lands of the State and in the waters thereof…provided, that the legislature may by statute, provide for the season when and the conditions under which the different species of fish may be taken." It is the second half of this statement that makes it clear that this "right to fish" is not absolute. In 1918, the California Supreme Court considered whether a law providing for the licensing of fishermen was unconstitutional because it violated Article 1, Section 25. The court rejected the argument, finding that the provision authorizing the Legislature to fix the seasons and conditions under which fish are taken was intended to leave the matter in the Legislature's discretion. As recently as 1995, a court reaffirmed the express authorization of fishing regulation by the Legislature created only a qualified, not fundamental, right to fish and was not intended to curtail the ability of the Legislature (or the Commission through Legislated authority) to regulate fishing.

Like other economic activities, from agriculture to manufacturing, fishing began expanding rapidly in the first few decades of the 1900s. In 1912, the Legislature responding by authorizing staff for the California Fish and Game Commission, which found itself with greater and greater responsibilities for managing industrial fisheries, in particular. In 1927, the Legislature responded to growing fishing pressures by creating a Department of Natural Resources, within which it housed a Division of Fish and Game. Over the coming decades, California state agencies and universities became leaders in the relatively new field of marine fisheries research and management. In 1945, the Legislature granted the Commission discretionary authority over recreational fisheries.

<u>Post World War II</u>

After World War II, the marine policies of California and other state and federal governments were based largely on several assumptions that reflected the progressive thinking of the time. First, the abundance of marine wildlife was thought to be nearly without practical limits. Second, scientists and fishery managers believed that we possessed enough knowledge to exploit marine populations at very high levels over long periods of time without jeopardizing them. Third, the value of marine wildlife was principally as a commodity to be processed and traded. Finally, the chief challenge in fisheries management was to expand domestic fishing fleets in order to exploit the assumed riches of the sea.

In the face of disturbing declines in a number of fisheries (see pp. 4-5), state and federal fisheries agencies around the country began an intensive review of prevailing policies in the mid-1960s. In 1967, the California Legislature passed the California Marine Resources Conservation and Development Act to develop a long-range plan for conservation and development of marine and coastal resources (1967 California Statutes Ch. 1,642). In the same year, Governor Ronald Reagan imposed an emergency two-year moratorium on sardine fishing (1967 California Statues Ch. 278).

Beginning in the 1970s, views slowly shifted. Marine wildlife and ecosystems were increasingly valued for themselves and for uses such as tourism, education, and scientific research. Recognition has been growing of the need to balance the fishing capacity of fleets with the often limited and uncertain productive capacity of marine wildlife populations. Rather than seeking to extract only the maximum yield from marine wildlife populations, fisheries managers began seeking levels that are likely to be ecologically and economically sustainable into the distant future.

California's Marine Heritage

For 1,100 miles, the spectacular mass of California's lands meets the Pacific Ocean. In many areas, mountains plunge into the oceans. Elsewhere, ancient shorelines stand as terraces above the surf. Streams and rivers break through the coastal mountains and, in some places, flow into bays and lagoons rimmed with wetlands. Offshore, islands and rocks break the surface.

This is what we can easily see. But beneath the surface of the water offshore, California's dramatic geological formations continue. Unlike the Atlantic or Gulf coasts, California's shallow continental shelf is quite narrow, generally no wider than five miles. At its broadest point off San Francisco, the shelf extends 30 miles offshore before plunging from 600 feet to the abyssal region at 6,000 feet. Beyond state waters, peaks called seamounts rise from the depths to the photic zone where sunlight spurs plant growth and attracts life.

Whether near or far from shore, the ocean bottom may be rocky, sandy, or silty. It may be flat or formed of rocky reefs. In many areas along the coast, great canyons cut into the continental shelf quite close to shore. For example, the Monterey submarine canyon, which is larger than the Grand Canyon of the Colorado, begins within miles of the shoreline. There, as in other submarine canyons, marine life normally found far offshore is drawn close to land by the deep waters. Off southern California, the ocean bottom appears like a piece of crumpled paper, with basins, troughs, canyons, peaks, and cliffs alternating in a checkerboard pattern.

Ocean currents introduce other dimensions to California's coastal waters. For much of the year, the California Current brings colder northern waters southward along the shore as far as southern California. There, where the coastline juts eastward, the California Current moves offshore. In the gap between the California Current and the mainland, the Southern California Countercurrent flows into the Santa Barbara Channel. Around Point Conception, these two currents meet, creating a rich transition zone. Closer to shore and deeper, the California Undercurrent also carries warmer water northward.

Seasonal changes in wind direction commonly create seasonal patterns for these currents. In March, for instance, northwesterly winds combine with the rotation of the Earth to drive surface waters offshore, triggering the upwelling of cold, nutrient-rich water from the depths. Fueled by sunlight and the nutrients, single-celled algae bloom and create a rich soup that fuels a blossoming of marine life, attracting larger animals from seabirds and swordfish to humpback and blue whales.

By September, as the northwesterly winds die down, the cold water sinks again and warmer waters return to the coast. This oceanic period lasts into October, when the predominant winds move to the southwesterly direction. These winds drive a surface current, called the Davidson Current, which flows north of Point Conception and inside the California Current, generally lasting through February.

Laid over this general pattern are both short-term and long-term changes. Local winds, topography, tidal motions, and discharge from rivers create their own currents in nearshore waters. Less frequently, a massive change in atmospheric pressure off Australia floods the eastern Pacific with warm water, which suppresses the normal pattern of upwelling. These short-term climatic changes, called El Niño, reduce the productivity of coastal waters, causing some fisheries and seabird and marine mammal populations to decline. El Niños can also increase the abundance of other species. For instance, warm waters that flow north in an El Niño carry the larva of sheephead and lobster from the heart of their geographical range in Mexico into the waters off California.

Other oceanographic changes last for a decade or more. In these regime shifts, water temperatures rise or fall significantly, causing dramatic changes in the distribution and abundance of marine life. The collapse of the California sardine fishery occurred when heavy fishing continued on sardine populations that were greatly reduced by a cooling of offshore waters in the late 1940s and early 1950s. In response to the decline in sardines, California law severely curtailed the catch. In 1977, waters off California began warming and remained relatively warm. The warmer water temperatures were favorable for sardines, whose abundance greatly increased. But the warmer waters also reduced the productivity of other fish, including many rockfishes, lingcod, sablefish, and those flatfishes that favor cold water for successful reproduction.

Currents and other bodies of water may differ dramatically in temperature and chemistry, as well as speed and direction. These factors all influence the kinds of marine life found in different bodies of water. In general terms, geography, oceanography, and biology combine to divide California marine fisheries and other marine life into two major regions north and south of Point Conception. Within each region, other differences emerge. Conservation and use of California's marine life depends partly upon recognizing these differences.

<u>Marine Life of California</u>

The waters off California are host to hundreds of species of fish. Thousands of species of marine invertebrates inhabit the sea floor from tidepools along the shoreline to muddy plains 8,000 feet deep. Dozens of species of coastal and offshore birds spend some part of the year in California's waters, as do 35 species of marine mammals.

This great variety of marine life reflects the different responses of groups of animals and plants to changing environmental conditions over long periods of time. In successfully meeting their needs for growth, survival, and reproduction, individual species have developed a set of characteristics that biologists call life history traits. These traits include age at maturity, maximum age, maximum size, growth rate, natural mortality, and feeding and reproductive strategies.

Differences among species can be dramatic. For instance, California market squid mature within 12 months and die soon after spawning, whereas widow rockfish do not mature until age five at the earliest and may live as long as 59 years. This has profound consequences for managing fisheries so that they are sustainable.

Reproductive strategies also vary. Queenfish, for instance, may spawn 24 times in a season, releasing their body weight in eggs into the open water, where most will be eaten whether or not they are fertilized. In contrast, species such as olive rockfish spawn just once a year, releasing up to 500,000 larvae, which have been fertilized and developed internally. Other species, including sharks and surfperches, bear a small number of fully functional and live young each year.

Amid the variety, the life histories of fish tend to fall into several larger categories. For instance, fish species that have low rates of mortality as adults, such as many species of sharks, bluefin tuna, and billfish, also mature late and reproduce in smaller numbers. Organisms that have high rates of mortality as adults, such as anchovies and squid, grow quickly, mature early, and reproduce in large numbers. Some species spend the first several months of their lives floating as planktonic larvae in ocean currents. Climate and oceanographic changes influence the abundance of these species more than does the number of spawning adults.

\Species differ also in their movements. For instance, during winter Dover sole move into deep water where they reproduce, then move into shallow water in the summer to feed. Pacific whiting migrate from their summer feeding grounds off Oregon and Washington to their winter spawning grounds off southern California and Baja California. By contrast, kelp bass, which can live to 30 years, venture less than a mile from their home range.

Individual plants and animals are part of larger communities that are linked in many ways. One of the clearest of relationships concerns who eats whom, also known as the food web. Generally, the eating begins with herbivores, who consume plants that have manufactured food through photosynthesis. These herbivores may be as small as the larva of an anchovy or as large as a basking shark. The smaller herbivores pass along much of the food value of the plants when they are eaten by primary carnivores, which in turn may be consumed by higher level carnivores.

These relationships among wildlife populations differ considerably among different habitats and communities. A decrease in the abundance of some species, due to fishing, habitat alteration, or climate changes, for instance, can affect species that feed upon them. Considering these interrelationships when managing fisheries requires an ecosystem perspective.

Healthy habitat can also play an important role in the abundance of marine wildlife. Some species of fish and shellfish are so dependent upon particular types of habitat, such as kelp forests or coastal wetlands, that the destruction or natural alteration these habitats can devastate wild populations. The damming of almost every major coastal river in California has driven most runs of Pacific salmon to dangerously low levels. Since the 1850s, 90 percent of the state's coastal wetlands have been destroyed, causing incalculable losses in coastal wildlife. Finally, pollution of coastal waters can expose marine animals to toxic chemicals and can foster changes in plant communities that wildlife depends upon.

Recent Developments

In the late 1990s, the Legislature responded to the shifts in understanding and public values as well as declines in some fisheries and nearshore ecosystems by adopting the Marine Life Management Act (MLMA) in 1998 and the Marine Life Protection Act (MLPA) in 1999.

Before the MLMA, the responsibility for managing most of California's marine resources harvested by commercial fisheries lay with the State Legislature, while the Department of Fish and Game and the Fish and Game Commission managed the recreational fisheries and those commercial fisheries that had catch quotas that changed periodically. Management of commercial fisheries under this division of responsibility was complicated, piecemeal, and oftentimes untimely, with necessary regulatory changes only occurring after much political deliberation and approval by both the Assembly and the Senate. In addition, this division of authority often resulted in laws and regulations that were inappropriate for the sustainability of the resource.

The MLMA transferred permanent management authority to the Fish and Game Commission for the nearshore finfish fishery, the white seabass fishery, emerging fisheries, and other fisheries for which the Commission had some management authority prior to January 1, 1999. As importantly, the MLMA broadened the focus of fisheries management to include consideration of the ecosystem—that is, the species that interact with a fishery.

In passing the MLPA, the Legislature recognized the benefits of setting aside some areas under special protection and of insuring that these marine protected areas (MPAs) were developed in a systematic manner, with clear goals and objectives, and effective management plans and programs for monitoring and evaluating their effectiveness. Rather than focusing on one use or value for marine areas, the MLPA recognized a wide range of values, including the conservation of biological diversity.

California is able to take advantage of several decades of experience and study regarding MPAs elsewhere in the United States and abroad, as well as within its own waters. As is the case in other areas of natural resource management and conservation, including fisheries management, there is much to learn about the effective design of MPAs and their benefits.

Recent work supports the legislative findings of the MLPA. In 2001, for instance, a committee of the National Academy of Sciences released its report *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems*. Like other reports of the National Academy of Sciences, this report can be considered an authoritative general review of the science of marine protected areas. Among other things, this expert panel concluded:

- A growing body of literature documents the effectiveness of marine reserves for conserving habitats, fostering the recovery of overexploited species, and maintaining marine communities.

- Networks of marine reserves, where the goal is to protect all components of the ecosystem through spatially defined closures, should be included as an essential element of ecosystem-based management.

- Choosing a location for a marine reserve or protected area requires an understanding of probable socioeconomic impacts as well as the environmental criteria for siting.

- It is essential to involve all potential stakeholders at the outset to develop plans for MPAs that enlist the support of the community and serve local conservation needs.

- Marine reserves and protected areas must be monitored and evaluated to determine if goals are being met and to provide information for refining the design of current and future MPAs and reserves.

- Sufficient scientific information exists on the habitat requirements and life-history traits of many species to support implementation of marine reserves and protected areas to improve management.

In these and other ways, the MLPA reflects state-of-the-art understanding of the opportunities afforded by networks of marine reserves, marine parks, and marine conservation areas.

Master Plan Framework

The MLPA calls for the development of a master plan by the Department of Fish and Game, and its adoption by the Fish and Game Commission. The MLPA Initiative has divided the master plan into two principal parts: a section providing guidance and interpretation in the application of the MLPA to the development of MPA networks, and a section describing the preferred alternatives for MPA networks that will make up the overall system. The MLPA Initiative is initially focusing on developing the former section as a basis for developing the latter section over the next six years.

This draft master plan framework is meant to establish and guide a process for implementing the MLPA through the design and adoption of MPA networks in each region along the California coast. In the coming years, application of the master plan's guidance in individual regions will no doubt lead to changes in the guidance itself. In this sense, this master plan framework should be viewed as a living document that should change adaptively to experience. When MPA networks have been adopted by the

Commission for all regions by 2011, the requirements of the MLPA for the adoption of a master plan will be met.

It is important to emphasize that this master plan framework is meant to guide decision making about MPA networks in individual regions. Specific application of this guidance will depend upon the physical, biological, social, and economic conditions in a particular region.

Expanded Contents

I. Background

a. California's current MPAs. *This section will profile existing California MPAs, their history, and the features that led to passage of the MLPA. A recent description of the individual MPAs prepared by the Department will be referenced and incorporated as an Appendix.*

b. Marine Life Protection Act (MLPA). *This section will briefly describe the principal features of the MLPA, including the following:*

- **i. Findings (FGC §2851)**
- **ii. Definitions (FGC §2852)**
- **iii. Goals (FGC §2853[b])**
- **iv. Required elements of the Marine Life Protection Program (FGC §2853[c])**
- **v. Preparation of the Master Plan (FGC §2855)**
- **vi. Components of the Master Plan (FGC §2856[a]2)**
- **vii. Alternative networks and a preferred alternative (FGC §2857)**
- **viii. Peer review (FGC §2858)**
- **ix. Commission process (FGC §2859)**
- **x. Prohibitions (FGC §2860)**
- **xi. Interim consideration of MPAs (FGC §2861)**
- **xii. Impacts of other activities (FGC §2862)**
- **xiii. Consultation with the U.S. Navy (FGC §2863)**

c. Marine Managed Areas Improvement Act (MMAIA). *This section will briefly describe the MMAIA, including the following:*

- **i. Findings (PRC §36601)**
- **ii. Definitions (PRC §36602)**
- **iii. Mission of the MMA System (PRC §36620)**
- **iv. Classification of MMAs (PRC §36700)**
  - **MPAs (state marine reserve, state marine park, state marine conservation area)**
  - **Other MMAs (state marine cultural preservation area, state marine recreational management area, state marine water quality protection area)General MMA Regulations (PRC §36710)**
- **v. Designating Authorities (PRC §36725)**
- **vi. Reclassifying Existing MMAs (PRC §36750)**
- **vii. The State Interagency Coordination Committee (PRC §36800)**
  - **Designation Guidelines (PRC §36850)**
  - **Proposal Instructions (PRC §36870)**
  - **Process for Review of Proposals (PRC §36900)**

Taken together, the MLPA, the MMAIA, and the MLMA represent the foundation of California's effort to ensure the sustainable use and conservation of California's coastal ecosystems.

II. Guidance regarding the Marine Life Protection Program

a. Goals of the Marine Life Protection Program. *This section will provide guidance in applying the MLPA's language on goals. This guidance will be based upon an evaluation of various definitions of key terms, as underlined below, and on discussions with stakeholders, the science team, and the task force. The key terms readily identified in the MLPA are underlined below.*

i. **To protect natural diversity and abundance, and structure, function, and integrity of marine ecosystems (FGC §2853[b]1),**
ii. **To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild where necessary (FGC §2853[b]2),**
iii. **To improve recreational, educational, and study opportunities in minimally disturbed marine ecosystems consistent with protecting biodiversity (FGC §2853[b]3),**
iv. **To protect marine natural heritage, including representative and unique marine habitats, for their intrinsic value (FGC §2853[b]4),**
v. **To set clearly defined objectives, effective management, adequate enforcement, and based on sound science (FGC §2853[b]5), and**
vi. **To manage the state's MPAs as a network, to the extent possible (FGC §2853[b]6).**

b. Required elements in the Marine Life Protection Program. *This section will provide suggested strategies and tools for carrying out activities required of the Marine Life Protection Program. This section will be based on a survey of current practices and theory sponsored by the Initiative, and on review by the science team, stakeholders, and the task force.*

i. **Improved marine life reserve component (FGC §2853[c]1).** *In evaluating an MPA network in a region, the Department may wish to consider the following criteria:*
   - *Which regional habitat types are represented in two or more marine reserves in this network?*
     - *Do these reserves include these habitat types and communities across different depth ranges?*
     - *Do these reserves include these habitat types and communities across different environmental conditions?*
     - *Is each of these habitat types and communities represented in two or more reserves in this region?*

ii. **Specific identified objectives and management and enforcement measures for all MPAs in the system (FGC §2853[c]2).** *Short-term research is underway*

regarding the design of state marine reserves, state marine parks, and state marine conservation areas. Draft language for this section will be added after receipt of a draft report from this research, which is expected by January 28. The scope of work is as follows:

- *Review available literature regarding approaches to the design of state marine reserves, parks, and conservation areas that have been applied or proposed in the United States or abroad, including the following aspects as they relate to implementation of the MLPA and the MMAIA:*
  - *Goals*
  - *Objectives*
  - *Size*
  - *Boundaries*
  - *Location*
  - *Number*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches regarding state marine reserve, park, and conservation area design, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

iii. Monitoring, research, and evaluation at selected sites for adaptive management insuring that the system meets terms of the MLPA (FGC §2853[c]3). *The Initiative is seeking to conduct an overview of monitoring and evaluation of MPAs in support of adaptive management. The statement of work is as follows:*

- *Review available literature regarding approaches to monitoring, and evaluation of marine protected areas and marine protected area networks that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches to monitoring, research, and evaluation of marine protected areas and marine protected area networks, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

iv. Education of the public, and encouragement of public participation (FGC §2853[c]4). *Short-term research is underway that will provide suggestions based on current policy and practice in the United States and elsewhere regarding public education and involvement. See III.b.x below.*

v. A process for establishment, modification, or abolishment of existing or new MPAs that involves constituents as in FGC §7050 and facilitates designation of MPAs (FGC §2853[c]5). *Draft language for this section will be prepared once short-term research described in III.B.vii below is completed at the end of*

January. This section also will draw upon tools for stakeholder involvement identified in the Initiative's stakeholder strategy.

III. Preparation of the Master Plan (FGC §2856[a]2)

a. Process for preparing the Master Plan, including consideration of information from local communities and interested parties including the following (FGC §2855). *This section will identify strategies that should be considered for soliciting and incorporating information from local communities and interested parties in the course of developing alternative proposals for future MPA networks in individual regions.*

- **i. Practical information on the marine environment, history of fishing and other uses, fishery closures, and water pollution;**
- **ii. Socioeconomic and environmental impacts of alternatives;**
- **iii. Design of monitoring and evaluation activities;**
- **iv. Methods to encourage public stewardship.**

b. Sources of information (FGC §2856[a]1). *The sources of information cited here will appear in the appendices and will be based on short-term research sponsored by the Initiative and on other sources.*

c. Required elements of a Master Plan.

- **i. Recommendations on extent and types of habitat for the MPA system and marine life reserves, described on maps with existing information, including rocky reefs, intertidal zones, sandy or soft ocean bottoms, underwater pinnacles, sea mounts, kelp forests, submarine canyons, seagrass beds (FGC §2856[a]2[A]).** *This section will identify those habitat types that should be considered in the siting of MPAs in individual regions, as well as sources of information for identifying the distribution of such habitats statewide and regionally. Recommendations on the extent and types of habitat for the MPA system in specific regions will be developed as each region successively develops alternative proposal for MPA networks in the coming years.*

- **ii. Identification of species or groups of species likely to benefit from MPAs and their habitat (FGC §2856[a]2[B]).** *Previously, the Department proposed a list of species likely to benefit from MPAs. The Initiative will sponsor an independent review of this list. This review will describe the process used by the Department in initially developing the list as well as approaches used in other similar efforts in California and elsewhere, and will suggest a process for reviewing and revising this list periodically.*

- **iii. Recommendations for improving the guidelines for MPA networks in FGC §2857(c) including minimum sizes for individual marine reserves (FGC §2856[a]2[C]).** *This section will be based upon an Initiative-sponsored survey of current theory and practices regarding the design and evaluation of MPA networks. Draft language for this section will be based on draft reports from this*

research due by the end of January. The scope of work for the research is as follows:

- *Review available literature regarding approaches to the design of marine protected area networks that have been applied or proposed in the United States or abroad, including the following aspects as they relate to implementation of the MLPA and the MMAIA:*
  - *Goals*
  - *Objectives*
  - *Size*
  - *Boundaries*
  - *Location*
  - *Number*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches regarding marine protected area network design, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

This section will also draw from past discussion of regional working groups, summaries of small-group meetings conducted by the Department in 2001-2002, discussions of the original Master Plan Team, the newly constituted Master Plan Science Advisory Team, and comments and suggestions from stakeholders, and discussions of the task force. This section also will draw from "Proposed Outline of Information Required for Proposals for Alternative Networks of Marine Protected Areas," which appears in Appendix D, which includes the kind of more detailed guidance necessary for designing and evaluating networks.

iv. **A simplified classification system (FGC §2856[a]2[E]).** *Based on a 2000 report by The California Resources Agency, the Legislature passed the Marine Managed Areas Improvement Act, which established six classifications for marine managed areas; three of these are marine protected areas—state marine reserve, state marine park, and state marine conservation area. In October 2004, the Commission reclassified all state MPAs under this system. This section will also identify possible additional efforts to make these designations more readily understandable.*

v. **An evaluation of current MPAs based on the preferred alternative and recommendations whether they should be altered (FGC §2856[a]2[G]).** *This section will provide guidelines for evaluating existing and proposed MPAs and MPA networks as they are developed region by region. One source for this section will be an Initiative-sponsored survey of current theory and practices regarding the evaluation of MPAs and MPA networks. The scope of work of this short-term research is as follows:*

- *Review available literature regarding approaches to the evaluation of alternative marine protected areas and marine protected area networks*

that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;

- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches regarding evaluation of alternative MPAs and MPA networks, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

This section, as well as relevant sections of the outline required for alternative MPA network proposals, will draw upon other research the Initiative intends to undertake regarding the regulatory context within which the MLPA is being implemented and the interactions between MPAs and other regulatory regimes.

Elements of such an evaluation of existing MPAs may include:

- *Adequacy of existing management plans and funding*
- *Target habitats and ecosystems entirely unrepresented or insufficiently protected by existing MPAs and other management activities,*
- *Target habitats and ecosystems insufficiently protected by existing MPAs and other management activities, without replicates in the region or with replicates too widely spaced.*

vi. Recommended alternative networks of MPAs in each biogeographic region (FGC §2856[a]2[D]). *Alternative networks of MPAs will be added as they are developed by individual regions in the coming years. Evaluation of alternative networks will require the following the information:*

- *Regional goals and objectives for a network of MPAs*
  - *Relation of goals and objectives to the MLPA generally and to resource problems and opportunities in the region specifically*
- *General description of alternative MPA networks*
  - *Spacing of MPAs and overall regional level of protection*
  - *Proposed management measures*
  - *Proposed monitoring for evaluating the effectiveness of the site in achieving its goals*
  - *Proposed research programs,*
  - *Proposed education programs,*
  - *Enforcement needs and means of meeting those needs,*
  - *Funding requirements and sources,*
  - *Proposed mechanisms for coordinating existing regulatory and management authority,*
  - *Opportunities for cooperative state, federal, and local management.*

The description of an alternative MPA network should include the following information for each MPA site within the network:

- *What are the boundaries of this MPA?*
- *What is the total area of the MPA?*
- *What is the total shoreline length of the MPA?*
- *Does this MPA expand upon an existing MPA?*
- *What is the overall goal of this MPA?*

- *What are the objectives that serve this goal?*
- *What species, populations, habitats, or ecosystem functions are of most concern in this area?*
    - *What are the chief threats to these features?*
        - *Which of these threats are amenable to management?*
    - *What restrictions are proposed that address these threats?*
    - *What additional restrictions or designations (e.g. water quality protection areas) would help address these threats?*
- *What features does the site display among those identified for different types of MPAs by the State Interagency Coordinating Committee for Marine Managed Areas?*

vii. Recommendations for a preferred siting alternative for a network of MPAs (FGC §2856[a]2[F]). *As MPA network alternatives are developed for each region, the Department will select a preferred siting alternative from among the range of siting alternatives developed for each region. The Master Plan will identify criteria which the Department may use in these decisions. These criteria may include:*

- *How does the network emphasize (much of this is from the MPT):*
    - *areas where habitat quality does (or potentially can) support diverse and high-density populations,*
    - *benthic habitats and non-pelagic species,*
    - *hard bottom as opposed to soft bottom, because fishing activities within state waters have had the greatest impact on fishes associated with hard bottom, and because soft bottom habitat is interspersed within areas containing rocky habitat,*
    - *habitats associated with those species that are officially designated as overfished, with threatened or endangered species, and productive habitats such as kelp forests and seagrass beds?*
- *How does the network include*
    - *unique habitats,*
    - *a variety of ocean conditions such as upwelling centers, upwelling shadows, byas, estuaries, and exposed and semi-protected coastlines?*
- *How does the network incorporate or expand upon existing MPAs that are considered to be effective?*
- *How does the network include a variety of sizes and types of MPAs that are dispersed in a network that does the following?*
    - *Provide enough space within individual MPAs for the movement of juveniles and adults of many species.*
    - *Achieve beneficial ratios of edge to area,*
    - *Help to include a variety of habitats,*
    - *Facilitate analysis of the effects of different-sized MPAs,*
    - *Facilitate analysis of the effects of different types of MPAs,*

- *Provide a network of sources for larval dispersal that are interconnected,*
- *Enable the use of MPAs as reference sites to evaluate the effects of climate change and other factors on marine ecosystems, without the effects of fishing,*
- *Enable the use of MPAs as reference sites for fisheries management,*
- *Minimize the likelihood that catastrophic events will impact all replicate MPAs within a biogeographic region.*
- *If an MPA is less restrictive than a reserve, how do different uses and restrictions affect achieving the objectives immediately above?*

- *How does the network use simple and easily recognizable boundaries to facilitate identification and enforcement of MPA regulations?*
- *Where feasible, how does the network locate MPAs in areas where there is onsite presence to facilitate enforcement?*
- *How does the network consider non-extractive uses, cultural resources, and existing fisheries and fishing regulations?*
- *How does the network consider proximity to ports, safe anchorage sites, and points of access, to minimize negative impacts on people and increase benefits?*
- *How does the network facilitate monitoring of MPA effectiveness by including well-studied sites, both in MPAs and unprotected areas?*
- *How does the network consider positive and negative socioeconomic consequences?*
- *Current uses:*
  - *What are the current uses of the site that are likely to be affected?*
  - *What are the likely impacts of the site upon these uses?*
- *Future uses:*
  - *How are current uses expected to change in response to the site?*
  - *What are the socio-economic impacts of these changes?*
- *Costs and benefits:*
  - *What uses are likely to benefit from the site, and how?*
  - What uses are likely to suffer from the site, and how?

viii. Recommendations for monitoring and evaluation in selected areas of the preferred alternative in support of adaptive management (FGC §2856[a]2[H]). *Draft language presenting suggested strategies for monitoring and evaluation will be prepared once the short-term research described in II.b.iii above is completed.*

ix. Recommendations for enforcement and management in the preferred alternative that may apply statewide or specific types of sites (FGC §2856[a]2[I]).

x. Recommendations for continued and improved enforcement, including use of advanced surveillance technology (FGC §2856[a]2[J]). *Draft language will be prepared for this section based on two short-term survey projects now underway regarding management and enforcement. Reports from this research are expected at the end of January.. Regarding management, the scope of work is as follows:*

- *Review available literature regarding approaches to the management of marine protected areas and marine protected area networks that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches regarding management, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

Regarding enforcement and implementation of regulations, the scope of work is as follows:

- *Review available literature regarding approaches to the implementation of regulations in marine protected areas and marine protected area networks, including education and economic or other incentives as well as traditional enforcement activities, that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches to the implementation of regulations, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

xi. Recommendations for funding sources for management of MPAs and implementation of the MLPA (FGC §2856[a]2[K]). *This section will be based partly on Initiative-sponsored research, which is expected by the end of January. The scope of work is as follows:*

- *Review available literature regarding approaches to funding marine protected areas and marine protected area networks that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches to funding, as they may apply under the MLPA and the MMAIA.*

This initial research and language will provide the basis for developing a broader strategy for funding of full implementation of the MLPA by December 2005.

xii. Additional appropriate components of the Master Plan (FGC §2856[b]).

IV. Discussion of preferred alternative networks. *Much of this section will be based on material presented in earlier sections, including the definitions of key terms, goals and objectives, replication of habitats in MPAs, size, number and types of MPAs.*

a. Objectives are to protect habitat from human activities including fishing, and/or enhance a species or group of species by restricting fishing for that species or group (FGC §2857[b]);
b. Each MPA shall have goals and objectives (FGC §2857[c]1);
c. Marine life reserves shall include a representative variety of habitats and communities across range of depths and environmental conditions (FGC §2857[c]2);
d. Similar types of habitats and communities shall be represented in more than one reserve in each region (FGC §2857[c]3);
e. Reserves are to be designed to avoid activities that upset natural ecological functions (FGC §2857[c]4);
f. Network and individual MPAs are to be of adequate size, number, type of protection, and location to meet objectives of network and network as a whole meets goals and guidelines of the MLPA (FGC §2857[c]5);
g. Network design shall take account of kelp beds (FGC §2857[d]); *The Department sponsors annual aerial surveys of kelp beds. Results from these surveys and from other sources will be incorporated into the design of MPA networks in each region.*
h. Phasing in MPAs may be recommended (FGC §2857[e]); *Broadly speaking, the master plan framework will develop a suggested schedule for phasing in the development of MPA networks in each region through 2011. More specifically, the Initiative is sponsoring a short-term review of theory and practice of phasing of MPAs within networks. The scope of works is as follows:*
- *Review available literature regarding approaches to the phasing of marine protected areas and marine protected area networks that have been applied or proposed in the United States or abroad, as they relate to implementation of the MLPA and the MMAIA;*
- *Consult with knowledgeable authorities regarding the above;*
- *Summarize and compare approaches regarding phasing, including costs, benefits, and controversies, as they may apply under the MLPA and the MMAIA.*

V. Appendices

- **a. References**
- **b. Glossary and acronyms**
- **c. Species likely to benefit**
- **d. Existing state marine protected areas**
- **e. Proposed outline of information required for alternative networks**
- **f. Implementation of the MLPA 1999-2004**
- **g. Statutes**
- **h. Preparers, Master Plan Team Members**
- **i. Consultations with other agencies (FGC §2855[b]4)**
- **j. Consultations with constituents (FGC §2855[b]4)**
- **k. Consultations with local communities (FGC §2855[c])**
- **l. Regional workshops (FGC §2857)**
- **m. Peer review of the master plan (FGC §2858)**
- **n. Departmental public hearings on the draft master plan (FGC §2859[b])**
- **o. Commission public hearings on the master plan (FGC §2859[c])**
- **p. Comments from the Joint Committee on Fisheries and Aquaculture (FGC §2859[d])**