

# Appendix L. Estimated Long-Term Costs to Implement the California MLPA

April 20, 2006 DRAFT

## Executive Summary

Based upon an analysis of costs of similar programs, the estimated total costs for implementing the California Marine Life Protection Act (MLPA) for fiscal year 2006-2007 range from \$6.1 to \$20.9 million, with an average of \$12.9 million, and increases as new study regions are designated and become operational. Total costs begin to stabilize in 2011-12 at the range of \$9.2 to \$42.8 million annually, with an average of \$24.1 million, as all regions are expected to be designated (Table 1).

**Table 1: Estimated total annual costs to implement the MLPA (FY 2005-2015) (millions of U.S. dollars)**

Total Annual Costs (\$US million)										
Fiscal year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
minimum	\$4.3	\$6.1	\$7.5	\$9.0	\$10.6	\$9.5	\$9.2	\$9.2	\$9.2	\$9.2
average	\$8.3	\$12.9	\$16.4	\$19.8	\$24.7	\$25.3	\$24.1	\$24.1	\$24.1	\$24.2
maximum	\$13.5	\$20.9	\$26.5	\$32.0	\$41.5	\$44.7	\$42.8	\$42.8	\$42.8	\$43.0

For fiscal year 2006-2007 (July 1, 2006-June 30, 2007) the estimated cost range includes continued operation of the Channel Island MPAs, start-up costs and operation of central coast MPAs and the design of MPAs in the next study region.

However, there are several sources that have funded MPAs in the Channel Islands since their establishment, including the California Department of Fish and Game (DFG)<sup>2</sup>, the Channel Islands National Marine Sanctuary (\$1.4 million), the Channel Islands National Park (\$1.3 million), and other monitoring efforts (\$940,000) for a total of \$3.6 million (not including DFG funding from other sources) for fiscal year 2005. The level of funding of MPAs in the Channel Islands listed above for the DFG, Channel Islands National Marine Sanctuary, and the Channel Islands National Park may change in the future.

If future Channel Island MPA funding approximates fiscal year 2005 levels, the estimated new funding requirements by the state for MLPA may be decreased by roughly \$3.6 million.

Partnerships, such as those illustrated for the Channel Islands, may be possible for other regions of the state and may significantly reduce the estimated cost to the state of implementing the MLPA. However, the purpose of this document is to estimate the range of costs regardless of who is performing the activity.

<sup>2</sup> While the DFG has used a variety of fund sources to support monitoring at the Channel Islands, there is no direct budget for these efforts.

## Introduction

Implementation of the California Marine Life Protection Act (MLPA) requires a process to reexamine and redesign a system of marine protected areas (MPAs) in state waters. The Act calls for the MPAs to be designed and managed, to the extent possible, as a network. The process to design MPAs includes setting regional goals and objectives, analyzing existing MPAs and other regulations, designing MPAs that together serve as a network for the entire state, and then ensuring the operation of that network through effective management, including enforcement, education, and monitoring. The MLPA calls for adaptive management, requiring regular assessment of how well the network of MPAs is meeting objectives and possible changes in the MPAs or revisions of goals and objectives.

In order for the state of California to effectively design and manage MPAs, the potential costs must be determined. However, little information exists on the costs of designing and operating marine protected areas (Balmford *et al.* 2004). The most comprehensive study to date analyzed annual reoccurring costs for 83 individual MPAs worldwide (Balmford *et al.* 2004). Costs spanned six orders of magnitude based upon the size, proximity of the MPA to shore, and whether the MPA was located in a developed country. The annual median cost per square mile was determined to be US\$18,684 (Balmford *et al.* 2004)<sup>2</sup>. Even less information is known about MPAs that are designed and managed as a network.

To begin estimating MLPA implementation costs, the MLPA Initiative staff decided to analyze actual program costs for marine protected area programs rather than use educated guesses of the number of personnel, equipment required. The MLPA Initiative staff first collected and analyzed actual program costs from large-scale programs for marine ecosystem protection. The actual program costs were then used as inputs to a model to determine MLPA implementation costs on a year-by-year basis for the next ten years. The MLPA cost estimates can help guide planning for MLPA implementation by serving as a bounding exercise of cost ranges, but should not be interpreted as precise predictions of costs.

The collection and analysis of program costs will be explained followed by an explanation of the cost model and its results.

## Experience to Inform Estimated Costs to Design and Manage MPAs in California

Actual program costs were assembled from four sources, two of which were suggested for inclusion by stakeholders in a November 2005 meeting:

1. MLPA Initiative experience in the Central Coast Project Area, January 2005-March 2005
2. Channel Islands marine protected areas, fiscal year 2005.
3. Monterey Bay National Marine Sanctuary, fiscal year 2004 through fiscal year 2006.
4. Florida Keys National Marine Sanctuary, fiscal year 2005.

Implementation of the MLPA requires several distinct activities. Understanding those activities and associated costs will inform discussion of MLPA efforts. Ten cost categories were identified in this analysis to reflect the activities of MLPA implementation. The same ten cost categories are subsequently used in the cost model.

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<sup>2</sup> Balmford et al. p. 9694-9697, original estimate listed on per square kilometer basis, staff converted to square mile basis.

1. **Design:** includes costs to designate MPAs such as personnel, facilitation, other contracted services, meeting costs (including webcasting of meetings), printing and reproduction of materials, travel, data collection, geographic information system management.
2. **One-time start up:** includes one-time expenses incurred after designation of the MPA(s), such purchase of boats and equipment and costs associated with recruiting personnel.
3. **Baseline science and socioeconomic conditions:** used to evaluate the effectiveness of MPAs over time. Costs may include benthic or trawl surveys, water sampling, socioeconomic surveys and contracted services if needed.
4. **Operations and management:** ongoing expenses associated with the management of the MPA such as personnel (including benefits), travel, meetings, office lease and maintenance of equipment.
5. **Enforcement:** includes enforcement personnel and equipment.
6. **Education and outreach:** includes costs such as signage, dioramas, docent programs and publications.
7. **Monitoring:** includes biotic and socioeconomic conditions. Costs may include benthic or trawl surveys, water sampling, socioeconomic surveys and contracted services if needed.
8. **Adaptive management:** review and adjustments to MPA management. Costs may include meetings with a stakeholder group including travel, facilitation, publications and other contracted services as needed.
9. **Refresh equipment, materials, people:** costs may include renovations of equipment and recruitment and training of staff.
10. **Unallocated costs:** In order to ensure accuracy of the total program budget, this last cost category is used for items that cannot be placed in one of the proceeding 9 categories.

Overhead costs, such as office lease and equipment, can represent a significant portion of program costs. For programs that did not include such costs, Marine Life Protection Act Initiative and Channel Islands MPAs, the estimated costs were increased by a standard rate of 23% to account for overhead costs. Similarly, programs for which indirect costs (such as personnel benefits) were not included, the estimated costs were increased by a standard rate of 40%. The Channel Islands National Marine Sanctuary (as a component of the Channel Islands MPAs) was the only program adjusted to reflect indirect costs.

However, there are weaknesses in using the actual costs from marine protected area programs that should be noted. First of all, two of the marine protected area programs, Monterey Bay National Marine Sanctuary and the Florida Keys National Marine Sanctuary, generally do not restrict fishing within the sanctuary<sup>3</sup>. Therefore, costs for enforcement may underestimate that expected for MPAs created as a result of the MLPA Initiative process. Second, each program has a different structure to their budget and while every effort has been made to be consistent within cost categories, it is possible that some funds are misallocated.

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<sup>3</sup> Ecological reserves within the Florida Keys National Marine Sanctuary prohibit fishing.

Despite this fact, misallocated funds would still be incorporated into the model and contribute to the year-by-year estimated total cost.

Detailed information regarding the source of budgetary information is available in the notes on source for Table 2 and in the references cited sections.

**Table 2: Annual Program Costs and Summary of Cost Ranges**

Costs are on annual basis unless otherwise stated (\$US thousands)		MPA Programs						Summary		
Cost category		MLPA Central Coast Study Region Design <sup>i.</sup>	Channel Islands marine protected areas (FY 05) <sup>ii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY 06 <sup>iii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY 05 <sup>iii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY04 <sup>iii.</sup>	Florida Keys National Marine Sanctuary (FKNMS) FY 05 <sup>iv.</sup>	Minimum	Average	Maximum
<b>1. Design</b>	includes costs to designate MPAs such as personnel, facilitation, other contracted services, meeting costs (including webcasting of meetings), printing and reproduction of materials, travel, data collection, geographic information system management.	\$2,750	\$4,251					\$2,500	\$3,501	\$4,251
<b>2. One-time start up</b>	includes one-time expenses incurred after designation of the MPA(s), such purchase of boats and equipment and costs associated with recruiting personnel.		\$1,000 <sup>a</sup>	\$1,350 <sup>b</sup>	\$1,233 <sup>c</sup>	\$282		\$282	\$966	\$1,350
<b>3. Baseline science and socio-economic conditions</b>	used to evaluate the effectiveness of MPAs over time. Costs may include benthic or trawl surveys, water sampling, socioeconomic surveys and contracted services if needed.		<sup>d</sup>	\$34			\$485	\$34	\$260	\$485
<b>4. Operations and management</b>	ongoing expenses associated with the management of the MPA such as personnel (including benefits), travel, meetings, office lease and maintenance of equipment.			\$978	\$1,914	\$1,736	\$2,073	\$978	\$1,675	\$2,073
<b>5. Enforcement</b>	includes enforcement personnel and equipment.		\$1,119	\$157	\$162	\$147	\$1,250	\$147	\$567	\$1,250

<sup>a</sup> Purchase of \$1 million patrol boat by Channel Islands National Park, see Golfarb 2005.

<sup>b</sup> Santa Cruz visitor center. Considered one-time start-up costs for the purposes of the present analysis because they represent possible cost even though the MBNMS was designated more than 10 years ago.

<sup>c</sup> Santa Cruz visitor center, floating deck for R/V Fulmar, completion of Cambria visitor's center. Considered one-time start-up costs for the purposes of the present analysis because they represent possible cost even though the MBNMS was designated more than 10 years ago.

<sup>d</sup> Baseline science was not part of Golfarb 2005 analysis, incorporated into the monitoring budget.

**Table 2 (continued): Annual Program Costs and Summary of Cost Ranges**

Costs are on annual basis unless otherwise stated (\$US thousands)		MPA Programs						Summary		
Cost category		MLPA Central Coast Study Region Design <sup>i.</sup>	Channel Islands marine protected areas (FY 05) <sup>ii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY 06 <sup>iii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY 05 <sup>iii.</sup>	Monterey Bay National Marine Sanctuary (MBNMS) FY04 <sup>iii.</sup>	Florida Keys National Marine Sanctuary (FKNMS) FY 05 <sup>iv.</sup>	Minimum	Average	Maximum
<b>6. Education and Outreach</b>	includes costs such as signage, dioramas, docent programs and publications.		\$106	\$422	\$931	\$1,165	\$672	\$106	\$659	\$1,165
<b>7. Monitoring</b>	includes biotic and socioeconomic conditions. Costs may include benthic or trawl surveys, water sampling, socioeconomic surveys and contracted services if needed.		\$3,748 <sup>e</sup>	\$544	\$1,300	\$1,208	\$103	\$103	\$1,380	\$3,748
<b>8. Adaptive management processes</b>	review and adjustments to MPA management. Costs may include meetings with a stakeholder group including travel, facilitation, publications and other contracted services as needed			\$82	\$171	\$71	\$27	\$27	\$88	\$171
<b>9. Refresh equipment, materials, people</b>	costs may include renovations of equipment and recruitment and training of staff.			\$508	\$165	\$2,100	\$565	\$165	\$835	\$2,100
<b>10. Unallocated</b>	In order to ensure accuracy of the total program budget, this last cost category is used for items that cannot be placed in one of the proceeding 9 categories.				\$270	\$235	\$1,052 <sup>f</sup>	\$235	\$519	\$1,052
<b>TOTAL COST</b>			\$10,224	\$4,075	\$6,146	\$6,944	\$6,227			

<sup>e</sup> Includes Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), Minerals Management Service, Marine Applied Research and Exploration, the Nature Conservancy, Commonwealth, and Pacific States Marine Fisheries Commission (PSMFC) budgets dedicated to monitoring.

<sup>f</sup> Unallocated expenses include Upper and Lower Keys Damage Assessment and Restoration, permitting, partnerships, sanctuary advisory council support, and submerged cultural resources.

## Notes on sources for Table 2

- i. MLPA Initiative staff analysis of Central Coast study region expenditures from January 2005 through March 2006. Expenditures during this time period were increased by 23% to account for overhead expenses that are currently provided by the California Resources Agency and the Resources Legacy Fund Foundation. DFG expenditures include overhead and were not increased by 23%.
- ii. Channel Islands MPA costs derived from Golfarb (2005). Personal communication between Gabriela Golfarb, John Ugoretz (DFG), Gary Davis (Channel Islands National Park, CINP), Sean Hastings (Channel Islands National Marine Sanctuary, CINMS), and Julie Bursek (CINMS). Budget numbers later confirmed with John Ugoretz and Gary Davis. Budget for DFG, CINMS, and CINP was increased by 23% to account for overhead costs that were previously not included. Budget for CINMS also increased by 40% to reflect indirect costs such as personnel benefits.
- iii. Monterey National Marine Sanctuary budget documents. Budget allocation based upon personal communication between Amy Boone, Marine Life Protection Act Initiative, and Bill Douros, Regional Superintendent (acting), West Coast Region, National Marine Sanctuary Program.
- iv. Florida Keys National Marine Sanctuary budget documents. Budget allocation based upon personal communication between Amy Boone, Marine Life Protection Act Initiative, and Bill Douros, Regional Superintendent (acting), West Coast Region, National Marine Sanctuary Program.

## Cost Model

The minimum, average, and maximum of each of the ten cost categories (shaded columns of Table 2) serve as inputs into the year-by-year cost model. However, before explaining the year-by-year cost model, it is important to note that the cost categories differ with respect to their “timing” and geographic scale. Table 3 outlines how cost categories vary with respect to “timing”, such as activities conducted on a one-time basis, annually, or every 5 years. In addition, some cost categories are conducted at the study region scale (ie. Central Coast) while activities such as monitoring and adaptive management are conducted at a biogeographical region scale (ie. Southern California Bight). The Master Plan Framework (MPF) identifies two biogeographical regions: the Southern California Bight and the Oregonian province (MPF, p.49).

This model assumes the costs of managing the existing Channel Island MPAs as part of the MLPA cost estimate. The MLPA Initiative staff anticipates that the MLPA will be implemented in six study regions and for the purposes of this analysis are labeled Channel Islands, Central Coast, Region B, Region C, Region D, and Region E.

**Table 3: Summary of Timing and Geographic Scale of Cost Categories**

<b>Cost category</b>	<b>Timing</b>	<b>Geo-graphic scale</b>	<b># Geo-graphic units</b>	<b>Name of geographic units</b>
<b>1. Design</b>	Once	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>2. One-time start up</b>	Once	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>3. Baseline science and socioeconomic conditions</b>	Once	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>4. Operations and Management</b>	Annual	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>5. Enforcement</b>	Annual	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>6. Education and Outreach</b>	Annual	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>7. Monitoring</b>	Annual	Biogeographic region	2	Southern CA Bight, Oregonian
<b>8. Adaptive management processes</b>	Every 5 years	Biogeographic region	2	Southern CA Bight, Oregonian
<b>9. Refresh equipment, materials, people</b>	Every 5 years	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E
<b>10. Unallocated</b>	Annual	Study region	6	Channel Islands, Central Coast, Region B, Region C, Region D, Region E



The year-by-year model begins with an identification of the number of cost categories applicable for each year (see Table 4). For example, in fiscal year 2005-2006, there is 1 study region undergoing design (Central Coast) and 1 study region which is operational, requires enforcement, education and outreach, monitoring, and has unallocated costs (Channel Islands). The costs associated with each cost category is then calculated by multiplying the number of study regions or biogeographic regions with the minimum, average, and maximum costs for each cost category calculated from Table 2. For example, in fiscal year 2005-2006, there is 1 study region undergoing design (Central Coast) and the minimum, average, and maximum estimated costs for a design process is \$2,500,000; \$3,376,000 and \$4,251,000, respectively. Therefore, the total cost of design in fiscal year 2005-2006 ranges from \$2,500,000 to \$4,251,000 with an average of \$3,376,000.

This model assumes that there will be one design process occurring each year until all five remaining study regions have been designated. The first study region to be designed is the Central Coast in fiscal year 2005-2006 (currently underway), followed by Region B, C, D and E.

The fiscal year following design, the study region (i.e., 2006-2007 for the Central Coast) incurs one-time “start-up” costs and one-time costs to collect “baseline science and socioeconomic conditions.” In the same year the study region would also incur costs including “operations and management”, “enforcement”, “education and outreach”, and “unallocated costs”.

Two years following design, the study region would not incur any start-up costs but would only incur costs associated with “operations and management”, “enforcement”, “education and outreach”, “monitoring” and “unallocated costs”.

Lastly, in the fifth year after the design of the first study region of a biogeographic province (ie Central Coast in the Oregonian province), costs associated with “adaptive management” and “refresh equipment, people” would incur. It should be noted that the cost estimate for “adaptive management” and “refresh equipment, people” may be underestimated because the values for these cost categories are based upon programs which are generally smaller than a biogeographic region (Monterey Bay and Florida Keys National Marine Sanctuaries). The two biogeographic regions (Southern California Bight and Oregonian province) differ greatly in size and may incur substantially different costs. However, in order to preserve the transparency of the model, the model was not changed to account for this difference.

The minimum, average, and maximum costs for all ten cost categories are then summed at the bottom of Table 4 to arrive at the total annual cost on a year-by-year basis. Figure 1 illustrates the minimum, average, and maximum cost estimates for MLPA implementation on a year-by-year basis.

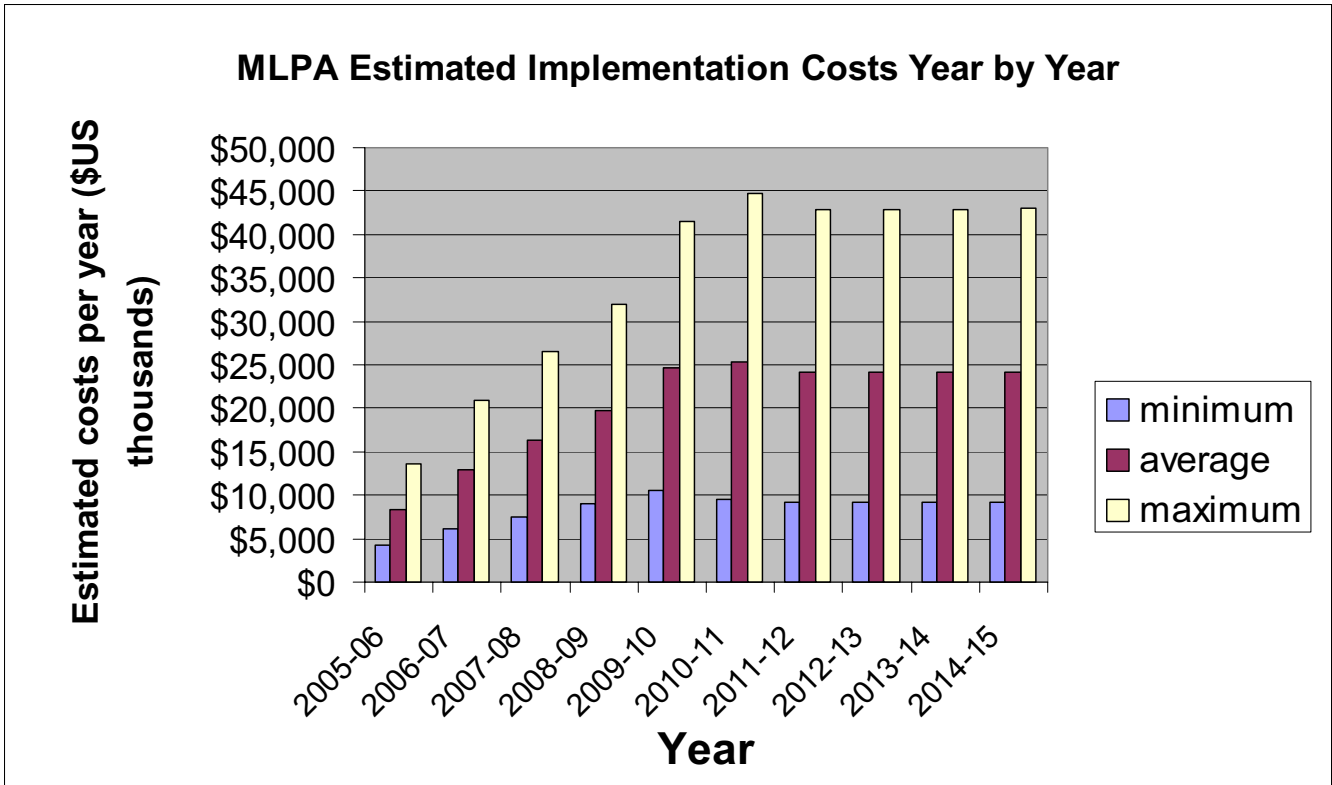


Figure 1: Estimated Year-by-Year Costs to Implement the MLPA (Years 1-10) (in thousands of U.S. dollars)

**Table 4: Year-by-Year MLPA Cost Estimates (fiscal years 2005-2015) (\$US thousands).**

Estimates by Year		1	2	3	4	5
Fiscal year		2005-06	2006-07	2007-08	2008-09	2009-10
Study Regions for Designation		Central Coast	Region B	Region C	Region D	Region E
Study Regions Operational		Channel Islands	Channel Islands, Central Coast	Channel Islands, Central Coast, Region B	Channel Islands, Central Coast, Regions B & C	Channel Islands, Central Coast, Region B, C, & D
# Study regions undergoing designation		1	1	1	1	1
# Study regions with one-time startup costs			1	1	1	1
# Study regions requiring baseline science and socioeconomic data collection			1	1	1	1
# Study regions operational		1	2	3	4	5
# Study regions requiring enforcement		1	2	3	4	5
# Study regions requiring education and outreach		1	2	3	4	5
# Biogeographic regions requiring monitoring		1	1	1	1	2
# Biogeographic regions undergoing adaptive management processes						1
# Study regions needing to refresh equipment						
# Study regions with unallocated costs		1	2	3	4	5
<b>Timing</b>	<b>Costs per category</b>					
One-time costs per study region	1. Design					
	minimum=\$2,750	\$2,750	\$2,750	\$2,750	\$2,750	\$2,750
	average=\$3,510	\$3,510	\$3,510	\$3,510	\$3,510	\$3,510
	maximum=\$4,251	\$4,251	\$4,251	\$4,251	\$4,251	\$4,251
	2. Start up					
	minimum=\$282	\$0	\$282	\$282	\$282	\$282
	average=\$966	\$0	\$966	\$966	\$966	\$966
	maximum=\$1,350	\$0	\$1,350	\$1,350	\$1,350	\$1,350
	3. Baseline science and socioeconomic conditions					
minimum=\$34	\$0	\$34	\$34	\$34	\$34	
average=\$260	\$0	\$260	\$260	\$260	\$260	
maximum=\$485	\$0	\$485	\$485	\$485	\$485	
Reoccurring annual costs per study region	4. Operations and management					
	minimum=\$978	\$978	\$1,956	\$2,934	\$3,912	\$4,890
	average=\$1,675	\$1,675	\$3,351	\$5,026	\$6,701	\$8,376
	maximum=\$2,073	\$2,073	\$4,146	\$6,219	\$8,292	\$10,365
	5. Enforcement					
	minimum=\$147	\$147	\$294	\$441	\$588	\$735
	average=\$567	\$567	\$1,134	\$1,701	\$2,268	\$2,835
	maximum=\$1250	\$1,250	\$2,500	\$3,750	\$5,000	\$6,250
	6. Education and Outreach					
	minimum=\$106	\$106	\$212	\$317	\$423	\$529
	average=\$659	\$659	\$1,318	\$1,978	\$2,637	\$3,296
	maximum=\$1,165	\$1,165	\$2,330	\$3,495	\$4,660	\$5,825
7. Monitoring						
minimum=\$103	\$103	\$103	\$103	\$103	\$206	
average=\$1,380	\$1,380	\$1,380	\$1,380	\$1,380	\$2,761	
maximum=\$3,748	\$3,748	\$3,748	\$3,748	\$3,748	\$7,495	
Reoccurring costs every 5 years per biogeographic region	8. Adaptive mgmt processes					
	minimum=\$27	\$0	\$0	\$0	\$0	\$27
	average=\$88	\$0	\$0	\$0	\$0	\$88
	maximum=\$171	\$0	\$0	\$0	\$0	\$171
	9. Refresh equipment people					
	minimum=\$165	\$0	\$0	\$0	\$0	\$0
average=\$835	\$0	\$0	\$0	\$0	\$0	
maximum=\$2,100	\$0	\$0	\$0	\$0	\$0	
Reoccurring annual costs per study region	10. Unallocated					
	minimum=\$235	\$235	\$470	\$705	\$940	\$1,175
	average=\$519	\$519	\$1,038	\$1,557	\$2,075	\$2,594
	maximum=\$2,100	\$1,052	\$2,104	\$3,156	\$4,208	\$5,260
<b>Total Annual Costs</b>	<b>minimum</b>	<b>\$4,319</b>	<b>\$6,101</b>	<b>\$7,566</b>	<b>\$9,032</b>	<b>\$10,628</b>
	<b>average</b>	<b>\$8,301</b>	<b>\$12,948</b>	<b>\$16,368</b>	<b>\$19,788</b>	<b>\$24,677</b>
	<b>maximum</b>	<b>\$13,539</b>	<b>\$20,914</b>	<b>\$26,454</b>	<b>\$31,994</b>	<b>\$41,452</b>

**Table 4 (continued): Year-by-Year MLPA Cost Estimates (Fiscal years 2005-2015) (\$US thousands).**

Estimates by Year		6	7	8	9	10
Fiscal year		2010-11	2011-12	2012-13	2013-14	2014-15
Study Regions for Designation		none	none	none	none	none
Study Regions Operational		Channel Islands, Central Coast, Region B, C, D, & E	Channel Islands, Central Coast, Region B, C, D, & E	Channel Islands, Central Coast, Region B, C, D, & E	Channel Islands, Central Coast, Region B, C, D, & E	Channel Islands, Central Coast, Region B, C, D, & E
# Study regions undergoing designation						
# Study regions with one-time startup costs		1				
# Study regions requiring baseline science and socioeconomic data collection		1				
# Study regions operational		6	6	6	6	6
# Study regions requiring enforcement		6	6	6	6	6
# Study regions requiring education and outreach		6	6	6	6	6
# Biogeographic regions requiring monitoring		2	2	2	2	2
# Biogeographic regions undergoing adaptive management processes						1
# Study regions needing to refresh equipment		1	1	1	1	1
# Study regions with unallocated costs		6	6	6	6	6
<b>Timing</b>	<b>Costs per category</b>					
One-time costs per study region	1. Design					
	minimum=\$2,750	\$0	\$0	\$0	\$0	\$0
	average=\$3,501	\$0	\$0	\$0	\$0	\$0
	maximum=\$4,251	\$0	\$0	\$0	\$0	\$0
	2. Start up					
	minimum=\$282	\$282	\$0	\$0	\$0	\$0
	average=\$966	\$966	\$0	\$0	\$0	\$0
	maximum=\$1,350	\$1,350	\$0	\$0	\$0	\$0
	3. Baseline science and socioeconomic conditions					
minimum=\$34	\$34	\$0	\$0	\$0	\$0	
average=\$260	\$260	\$0	\$0	\$0	\$0	
maximum=\$485	\$485	\$0	\$0	\$0	\$0	
Recurring annual costs per study region	4. Operations and management					
	minimum=\$978	\$5,868	\$5,868	\$5,868	\$5,868	\$5,868
	average=\$1,675	\$10,052	\$10,052	\$10,052	\$10,052	\$10,052
	maximum=\$2,073	\$12,438	\$12,438	\$12,438	\$12,438	\$12,438
	5. Enforcement					
	minimum=\$147	\$882	\$882	\$882	\$882	\$882
	average=\$567	\$3,402	\$3,402	\$3,402	\$3,402	\$3,402
	maximum=\$1,250	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500
	6. Education and Outreach					
	minimum=\$106	\$635	\$635	\$635	\$635	\$635
	average=\$659	\$3,955	\$3,955	\$3,955	\$3,955	\$3,955
	maximum=\$1,165	\$6,990	\$6,990	\$6,990	\$6,990	\$6,990
7. Monitoring						
minimum=\$103	\$206	\$206	\$206	\$206	\$206	
average=\$1,380	\$2,761	\$2,761	\$2,761	\$2,761	\$2,761	
maximum=\$3,748	\$7,495	\$7,495	\$7,495	\$7,495	\$7,495	
Recurring costs every 5 years per biogeographic region	8. Adaptive mgmt processes					
	minimum=\$27	\$0	\$0	\$0	\$0	\$27
	average=\$88	\$0	\$0	\$0	\$0	\$88
	maximum=\$171	\$0	\$0	\$0	\$0	\$171
	9. Refresh equipment people					
	minimum=\$165	\$165	\$165	\$165	\$165	\$165
average=\$835	\$835	\$835	\$835	\$835	\$835	
maximum=\$2,100	\$2,100	\$2,100	\$2,100	\$2,100	\$2,100	
Recurring annual costs per study region	10. Unallocated					
	minimum=\$235	\$1,410	\$1,410	\$1,410	\$1,410	\$1,410
	average=\$519	\$3,113	\$3,113	\$3,113	\$3,113	\$3,113
	maximum=\$2,100	\$6,312	\$6,312	\$6,312	\$6,312	\$6,312
<b>Total Annual Costs</b>						
	<b>minimum</b>	<b>\$9,482</b>	<b>\$9,166</b>	<b>\$9,166</b>	<b>\$9,166</b>	<b>\$9,193</b>
	<b>average</b>	<b>\$25,344</b>	<b>\$24,118</b>	<b>\$24,118</b>	<b>\$24,118</b>	<b>\$24,206</b>
	<b>maximum</b>	<b>\$44,670</b>	<b>\$42,835</b>	<b>\$42,835</b>	<b>\$42,835</b>	<b>\$43,006</b>

For fiscal year 2006-07 (July 1, 2006-June 30, 2007) the expected cost ranges range from \$6.1 to \$20.9 million, with an average of \$12.9 million. This includes:

**Table 5: Detailed allocation of MLPA implementation costs for fiscal year 2007**

Fiscal year 2006-2007 (\$U.S. millions)	Minimum	Average	Maximum
Continued operation of the Channel Islands MPAs	\$1.6	\$4.8	\$9.2
Start-up costs and operation of Central Coast MPAs	\$1.8	\$4.6	\$7.4
Designation of next study region	\$2.7	\$3.5	\$4.3
<b>TOTAL</b>	<b>\$6.1</b>	<b>\$12.9</b>	<b>\$20.9</b>

However, there are several sources that have funded MPAs in the Channel Islands since their establishment:

**Table 6: Fiscal year 2005 funding of MPAs in the Channel Islands**

Fiscal Year 2005	(\$U.S. millions)
CA Department of Fish and Game	\$1.3 <sup>4</sup>
Channel Islands National Marine Sanctuary	\$1.4
Channel Island National Park	\$1.3
Other monitoring efforts (i.e., PISCO)	\$.94
<b>TOTAL</b>	<b>\$ 3.6</b>

The level of funding of MPAs in Channel Islands listed above for the DFG, Channel Islands National Marine Sanctuary, and the Channel Islands may change in the future.

Therefore, assuming future Channel Island funding remains constant, the estimate of new funding requirements by the state for MLPA implementation may be decreased by roughly \$3.6 million.

<sup>4</sup> This funding comes from other DFG funds currently directed to Channel Islands Monitoring. In order to adequately fund monitoring without adversely impacting other programs, these funds must be replaced and are therefore not subtracted.

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## **Attachment A to Appendix L: Additional Budgetary Information**

After consulting with stakeholders in November 2005, the staff added budgetary information from several programs into the cost model including:

1. National Marine Sanctuary Program estimated costs for a single sanctuary
2. Great Barrier Reef Marine Park Authority, Australia
3. Southern California Bight Regional Monitoring Program (coordinated by Southern California Coastal Water Research Project, SCCWRP)
4. Central and Northern California Ocean Observing System (CeNCOOS)
5. California Oceanic Fisheries Investigations (CalCOFI)
6. National Estuarine Research Reserve System estimated cost for an individual reserve
7. San Francisco Estuary Institute (SFEI)
8. Surface Water Ambient Monitoring Program (SWAMP)
9. California Bay Delta Authority (CBDA) science program
10. Interagency Ecological Program (IEP)
11. San Diego Multiple Species Conservation Program (San Diego MSCP)
12. Western Riverside County Multiple Species Habitat Conservation Program (MSHCP)

The inclusion of these programs resulted in a substantial increase of the range of cost estimates. However, the average estimate for each cost category including these programs is within \$1 million of the averages in the present analysis. Therefore, staff decided to exclude these programs from the analysis as the large range of cost estimates was not thought to be useful to decision-makers.

Table 6 below provides the detailed budgetary information for the twelve programs listed above.



**Table 6: Costs for ecosystem protection (annual costs unless otherwise noted) (\$US thousands)**

Description	NOAA Estimated cost for a single sanctuary (low estimates)	NOAA Estimated cost for a single sanctuary (high estimates)	Great Barrier Reef Marine Park Authority	Southern California Bight Regional Monitoring Program (coordinated by SCCWRP)	Central and Northern California Ocean Observing System (CeNCOOS)	California Oceanic Fisheries Investigations (CALCOFI)	California Bay Delta Authority (CBDA) Science	Inter-agency Ecological Program (IEP)	National Estuarine Research Reserve System estimate for individual reserve	San Francisco Estuary Institute (SFEI)	Surface Water Ambient Monitoring Program (SWAMP)	San Diego MSCP	Western Riverside Co MSHCP
Notes on source	personal communication between Bill Douros, NOAA, and Amy Boone, MLPAI	personal communication between Bill Douros, NOAA, and Amy Boone, MLPAI	Average monitoring budget for 7 years: GBRMPA Annual reports 1999-2005, section D: financial statements	Personal communication between Amy Boone and Ken Schiff, SCCWRP	FY06 Funding <a href="http://www.cenccos.org/funding.htm">http://www.cenccos.org/funding.htm</a>	Personal communication between Amy Boone and Kathleen Ritzman	CBDA Annual report 2004	CBDA Annual report 2004	Golfarb 2005, pgs. 14-15, personal communication between Gabriela Golfarb and Laurie McGilvray	San Francisco Estuary Institute Single Audit Report	Budget for FY 2005-06, personal communication between Amy Boone and Brendan McCarthy, LAO	San Diego MSCP Annual report 2004 (p. 16)	Western Riverside County MSHCP Plan, appendix B02-A, budget years 1-5
<b>1. Design</b>	<b>\$750</b>	<b>\$1,100</b>											
<b>2. One-time start up</b>	<b>\$450</b>	<b>\$4,250</b>											
<b>3. Baseline science and socioeconomic conditions</b>	<b>\$75</b>	<b>\$650</b>											
<b>4. Operations and Management</b>	<b>\$600</b>	<b>\$2,100</b>							<b>\$566</b>				
<b>5. Enforcement</b>	<b>\$25</b>	<b>\$450</b>											
<b>6. Education and Outreach</b>	<b>\$75</b>	<b>\$800</b>											
<b>7. Monitoring</b>	<b>\$75</b>	<b>\$900</b>	<b>\$1,466</b>	<b>\$1,750</b>	<b>\$700</b>	<b>\$3000</b>	<b>\$10,425</b>	<b>\$11,350</b>	<b>\$156</b>	<b>\$3,077</b>	<b>\$6,100</b>	<b>\$1,650</b>	<b>\$4,627</b>
<b>8. Adaptive management processes</b>	<b>\$50</b>	<b>\$500</b>											
<b>9. Refresh equipment, materials, people</b>	<b>\$45</b>	<b>\$300</b>											
<b>10. Unallocated</b>	<b>\$250</b>	<b>\$900</b>											
<b>TOTAL COST</b>	<b>\$2,395</b>	<b>\$11,950</b>											