

California MLPA Master Plan Science Advisory Team
Draft Criteria for Creating the List of Species Likely to Benefit from
Marine Protected Areas in the MLPA North Coast Study Region
(revised December 14, 2009)

The Marine Life Protection Act (MLPA) requires that species likely to benefit from marine protected areas (MPAs) be identified; identification of these species contributes to the identification of habitat areas that will support achieving the goals of the MLPA. The draft *Marine Life Protection Act Master Plan for Marine Protected Areas (January 2008)* includes a broad list of species likely to benefit from protection within MPAs. The master plan also indicates that regional lists will be developed by the MLPA Master Plan Science Advisory Team (SAT) for each study region of the California coast. Species on each of the regional lists are likely to be prioritized for monitoring in the evaluation of MPAs.

To develop a list of species likely to benefit from MPAs in the MLPA North Coast Study Region (NCSR), the SAT has created a list of scoring criteria. This scoring system was first developed in the MLPA South Coast Study Region and creates a metric that provides more information than a simple on/off the list system. The scoring criteria were reevaluated for the NCSR and applied to species of interest in the study region. Each species is scored using “1” to indicate a criterion is met or “0” to indicate a criterion is not met.

Species on the list must meet the following filtering criteria:

- The species must occur in the study region.
- The species must score a “1” for either the “Removal and Discards” or “Disturbance” criteria under “Human Impacts.”
- The species must score a “1” for either the “Feature Association” or “Limited Adult Home Range” criteria under “Biological/Life History.”

For qualifying species, scores for criteria 1 through 5 will be summed to provide an overall score. A higher score suggests a species is more apt to benefit from or respond to MPAs. Criteria six through ten are not included as part of a species’ score, however they are still evaluated and will provide additional information regarding how a species might respond to MPAs. Where there are insufficient data to determine if a criterion is met or not, no score will be given, with new information incorporated as it becomes available over time. Because of this potential lack of data for some species, criteria were not given a weighted importance, since doing so would potentially bias well-studied species. Criteria were applied slightly differently for each broad taxonomic group. The following paragraphs will identify some caveats of the scoring system.

The criteria were applied similarly for fishes, invertebrates, algae, and plants. Criterion 1, Removal & Discards, was applied as outlined in the table below. Most fishes did not score for Criterion 2, Disturbance, though some invertebrates and algae did because of susceptibility to trampling. A species scored for Criterion 3, Feature Association, if it forms predictable breeding aggregations or is associated with submarine canyons or river mouths. For Criterion 4, Limited Adult Home Range, a species scored if, as an adult, it could be reasonably expected to stay within an MPA that followed the size guidelines developed by the SAT. Some taxa, such as algae and plants, easily met this criterion, while some species required a more detailed

literature search of adult home ranges and tagging studies. Finally, Criterion 5, Depressed Populations, included state- or federally-listed species of concern, as well as species considered to have lower-than-historic population sizes.

The general guidelines for scoring marine birds are as follows. Marine birds qualified for the ‘removal and discards’ criterion if they 1) are removed directly by hunting or 2) are removed incidentally as fisheries bycatch. For disturbance, three basic instances are considered: disturbance at breeding sites, disturbance at roosting sites, and disturbance at foraging areas. Disturbance at foraging areas is defined as fishing activity along mudflats for shorebirds, fishing activity within bays/estuaries for waterfowl and marsh birds, and fishing activity close to breeding colonies for nearshore foraging seabirds and at ‘hot spots’ for the more far ranging seabirds. ‘Hot spots’ are areas that concentrate nutrients and plankton, attracting high abundances of mid-trophic-level prey species. Feature associations for marine birds included breeding sites, roosting sites, bays/estuaries, and ‘hot spots’. Though all marine birds are far ranging outside the breeding season, breeding seabirds are central place foragers and must return to the colony throughout the day to incubate eggs and care for young. We consider breeding birds to have limited adult home ranges if their central place foraging range fell within the MPA sizing guidelines created by the SAT. Finally, marine birds scored for the depressed population criterion if they were recognized by the California Department of Fish and Game’s Office of Spill Prevention and Response as having an overall high conservation concern in California.

The general guidelines for scoring marine mammals are as follows. The ‘removal and discards’ criterion was scored if the species are thought to be removed incidentally as fisheries bycatch in the study area. The ‘disturbance’ criterion was scored for species likely to have lowered reproductive success if disruptive activities occur at breeding sites, based on studies from a variety of locations. The ‘feature association’ criterion was scored for species that use discrete breeding and resting sites, as well as for species that feed primarily in state waters. The ‘limited home range’ criterion was not scored for most species because many species range widely especially with respect to the size and spacing guidelines being used to propose MPAs. The ‘depressed population’ criterion was scored for species recognized as fully protected, threatened or endangered by the State of California or the federal government, although all marine mammal species are afforded special protection under the Marine Mammal Protection Act.

Table 1: Scoring criteria for species likely to benefit from MPAs

Consideration	Criteria	Clarifying Statements	Example Species	Species Descriptions
Human Impact	1* - Removal & Discards: Taken directly or indirectly in commercial or	DIRECTLY targeted for removal from the ecosystem.	Dungeness crab, Kombu, salmon	These species are directly targeted by fishermen and harvesters.

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	recreational fisheries or otherwise targeted for take or collection for other uses (e.g. research or tide pooling), or returned to the water as a discard in a fishery	INDIRECTLY removed from the ecosystem while targeting other species.	Black rockfish	This species is sometimes taken and kept while targeting salmon nearshore.
		Returned to the water as a discard in a fishery.	Coho salmon	It is illegal to keep this species in marine waters.
		Not expected to have a high rate of survival after being returned to the water.	Yelloweye rockfish	This species suffers from barotraumas when brought to the surface.
Human Impact	2* – Disturbance: Species that suffer reduced survival or reproductive output as a result of human disturbance.	Reduced reproductive success due to human disturbance (e.g. bird and mammal flushes).	Brandt's cormorant, Harbor seal	These species flush easily from nests or rookeries, leaving their young vulnerable.
		Reduced survival due to human disturbance (e.g. tide pool trampling).	California mussel, Rockweeds	These species can be trampled by tidepoolers.
Biological/ Life History	3* - Feature Association: Biomass or abundance would increase due to the protection of features species are known to favor.	Forages near specific oceanographic, geographic, or biological features.	Leopard shark, Cassin's Auklet	These species forage near particular features (shark, bays and estuaries; auklet, thermal fronts).
		Nests at specific features.	Brandt's cormorant	This species nests in established colonies.
		Breeds in specific, definable areas.	Chinook salmon	Salmon gather at river mouths prior to breeding.
		Rests near certain features.	Harbor seals	Harbor seals favor specific beaches for resting.
Biological/ Life History	4* - Limited adult home range	Limited or small adult home range.	Red abalone, Copper rockfish	These species move very little as adults
Human Impact	5 - Depressed population: A special status species or a species with abundance below the range of natural fluctuations.	Special status species.	California least tern	This is a federally endangered species.
		A species with depressed population abundance as the result of any human activity (such as removal, disturbance, or habitat loss or degradation)	Canary rockfish	Considered "overfished" by the Federal Groundfish FMP

Consideration	Criteria	Clarifying Statements	Example Species	Species Descriptions
Human Impact	6 - Habitat Degradation: Suffers negative impacts through ecological or habitat changes associated with human activities.	Critical habitat disappearing or degrading as a result of human activity not related to removal (e.g. harbor dredging, wetland draining).	Tidewater goby, Ghost shrimp	Gobies suffer from wetland loss, while ghost shrimp lose habitat during harbor dredging.
		Critical habitat disappearing or degrading as a result of removal activities (e.g. kelp harvesting).	Many juvenile rockfishes	Juvenile stages of most rockfish species are dependent on kelp forest habitat.
Biological/Life History	7 - Limited larval dispersal	Limited larval (or spore) dispersal.	Sea palm, Shiner surfperch	These species have short larval/spore dispersal distances.
Biological/ Life History	8 - Other Life History Traits: Has life history traits which would make it a good candidate for protection	Reaches maturity later in life.	Leopard shark	These species reach maturity relatively late in life.
		Low fecundity.	Cabezon	Cabezon have low fecundity.
		Long lifespan.	Bat ray, Red sea urchin	These species live relatively long (rays up to 26 yrs, urchins up to 100 yrs).
Biological/ Life History	9 - Limited distribution: A significant portion of its California distribution occurs within the study region.	A SIGNIFICANT PORTION of its California distribution occurs within the study region.	Stellar's sea lion	The majority of the Stellar's sea lion's CA range is in the study region.
Biological/ Life History	10 - Ecological importance: A species whose removal would cause major ecological change (food chain, diversity, etc), or a key species that defines or characterizes a habitat type.	Its removal would cause major ecological change.	Ochre seastar	Removing sea stars releases mussels from predation, which could alter community diversity.
		A key species that defines or characterizes a habitat type.	Bull kelp, Eelgrass	These species define their habitat types.

*Criteria denoted by an asterisk are an initial filter and a score of "1" must be achieved in one of the Human Impacts categories with an asterisk and one of the Biological/Life History categories with an asterisk.