

Marine Life Protection Act Initiative



Marine Birds and Marine Mammals Evaluations for Round 2 Draft MPA Proposals in the MLPA North Coast Study Region

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Methods Overview

Analyses quantify MLPA North Coast Study Region populations likely to benefit from MPAs for three use categories:

1. Breeding
2. Resting
3. Foraging



Notes about Round 2 Analyses

- Marine mammal analyses considered only proposed state marine reserves (SMRs) and special closures
- Marine bird analyses included proposed SMRs, special closures and some state marine conservation areas (SMCAs)
- SMCAs which proposed tribal uses were included separately because don't have information on uses to know if they meet criteria to be included in the marine bird analyses



Marine Bird and Mammal Analyses

Analysis 1: Protection at Breeding Sites

Investigated:

- percent (%) of bioregion marine bird breeding populations protected
- number of pinniped rookery sites protected
- protection of important marine bird breeding hot spots
- protection of important pinniped hot spots



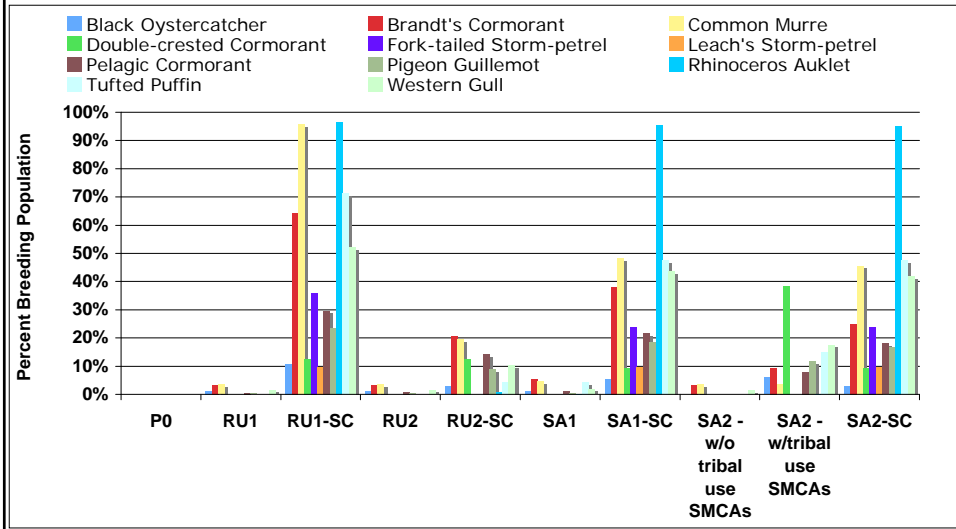


Seabird Breeding Colonies

Species	Number of Animals in the Study Region
Black Oystercatcher (BLOY)	248
Brandt's Cormorant (BRCO)	13105
Cassin's Auklet (CAAU)	4833
Common Murre (COMU)	258010
Double-crested Cormorant (DCCO)	2873
Fork-tailed Storm-Petrel (FTSP)	419
Leach's Storm-Petrel (LESP)	9414
Pelagic Cormorant (PECO)	5675
Pigeon Guillemot (PIGU)	3148
Rhinoceros Auklet (RHAU)	1063
Tufted Puffin (TUPU)	181
Western Gull (WEGU)	4046
Study Region Total	303014



Percent of Breeding Population



SC = Special Closures



Marine Bird Breeding Hot Spots

Breeding Hot Spots	Proposal 0	Ruby 1	Ruby 2	Sapphire 1	Sapphire 2
Castle Rock		Castle Rock Special Closure		Castle Rock Special Closure	Castle Rock Special Closure (seasonal)
False Klamath Rock		False Klamath Rock Special Closure	False Klamath Rock Special Closure		
Green Rock		Green Rock Special Closure			
Flatiron Rock		Flatiron Special Closure			
False Cape Rocks		False Cape Rock Special Closure			
Steamboat Rock		South Cape Mendocino SMR		South Cape Mendocino SMR	South Cape Mendocino SMR
		Steamboat Rock Special Closure	South Cape Mendocino SMR	Steamboat Rock Special Closure	Steamboat Rock Special Closure
Rockport Rocks		Rockport Rocks Special Closure			
Cape Viscaino		Vizcaino Rock Special Closure (seasonal)	Vizcaino Rock Special Closure (seasonal)	Vizcaino Rock Special Closure (seasonal)	



Marine Mammal Hot Spots

Population Hot Spots	Proposal 0	Ruby 1	Ruby 2	Sapphire 1	Sapphire 2
Southwest Seal Rock*		Southwest Seal Rock Special Closure		Southwest Seal Rock Special Closure	
Sugarloaf Island*		Sugarloaf Island Special Closure	Sugarloaf Island Special Closure	Sugarloaf Island Special Closure	Sugarloaf Island Special Closure
Vicinity of Castle Rock, Crescent City		Castle Rock Special Closure		Castle Rock Special Closure	Castle Rock Special Closure (seasonal)
South Bay, Humboldt Bay					
Arcata Bay, Humboldt Bay					
Mouth of the Eel River					

* Steller Sea Lion Rookery



Marine Bird and Mammal Analyses

Analysis 2: Protection at Roosting and Haulout Sites

Investigated:

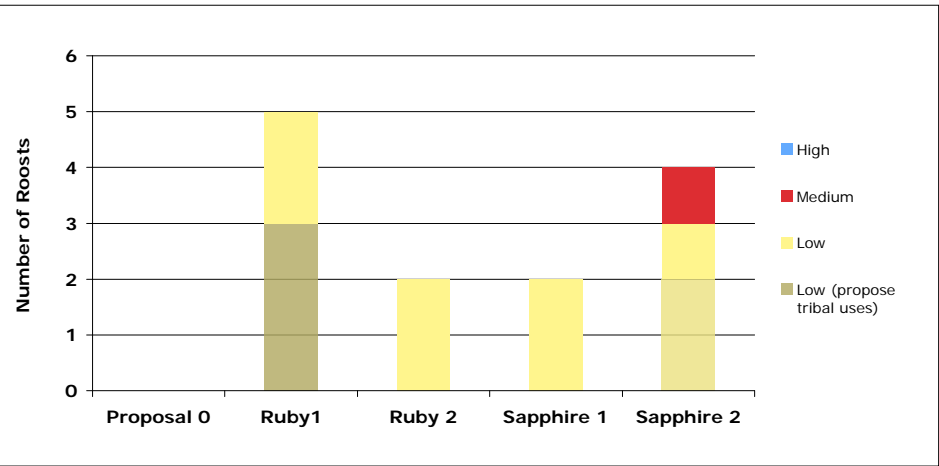
- percent (%) of study region populations protected for pinnipeds
- number and size of Brown Pelican roosts



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Brown Pelican Roosts





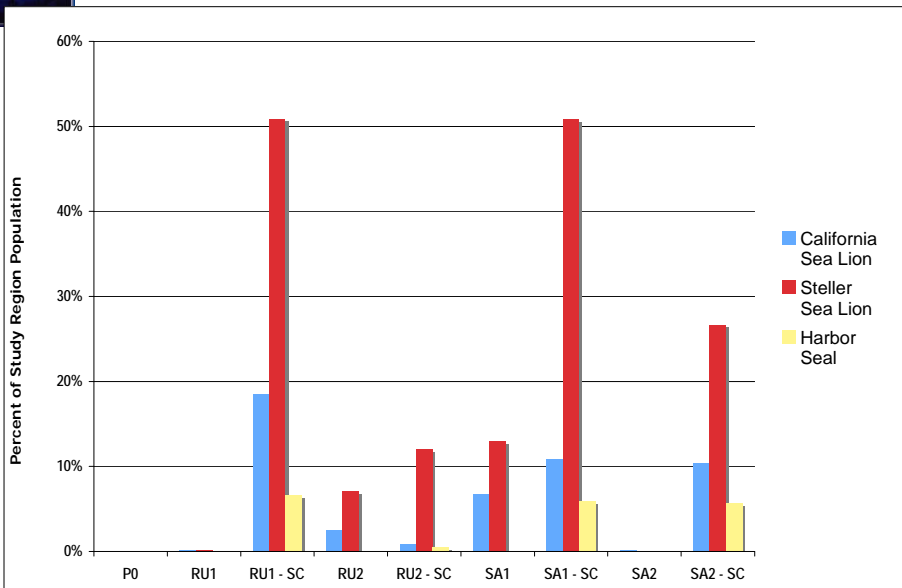
Pinniped Haulouts

Number of animals at haulouts within proposed state marine reserves and special closures

Draft MPA Proposal	Number of Species	California Sea Lion (% population)	Steller Sea Lion (% population)	Harbor Seal (% population)	Total # of Animals (% study region population)
Proposal 0	0	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Ruby 1	3	2467 (18.7%)	2504 (51.1%)	624 (6.6%)	5595 (20.3%)
Ruby 2	3	449 (3.4%)	939 (19.2%)	45 (0.5%)	1433 (5.2%)
Sapphire 1	3	2326 (17.6%)	3125 (63.7%)	558 (5.9%)	6009 (21.8%)
Sapphire 2	3	1397 (10.6%)	1307 (26.7%)	533 (5.6%)	3237 (11.7%)
Study Region Total	3	13200	4904	9451	27555



Percent of Haulout Population





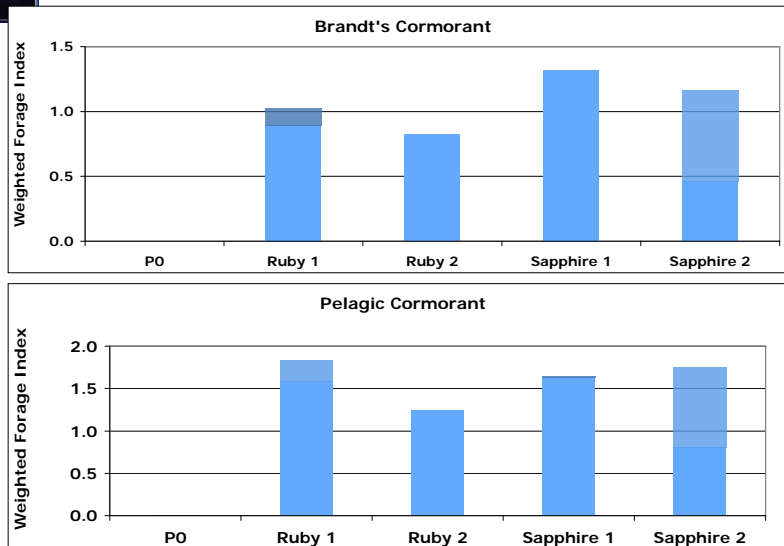
Marine Bird and Mammal Analyses

Analysis 3: Protection at Near-colony and At-sea Foraging Sites

Investigated amount of foraging area protected, number of animals benefiting



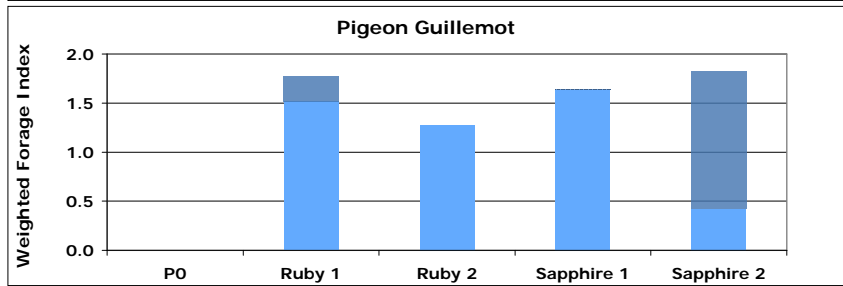
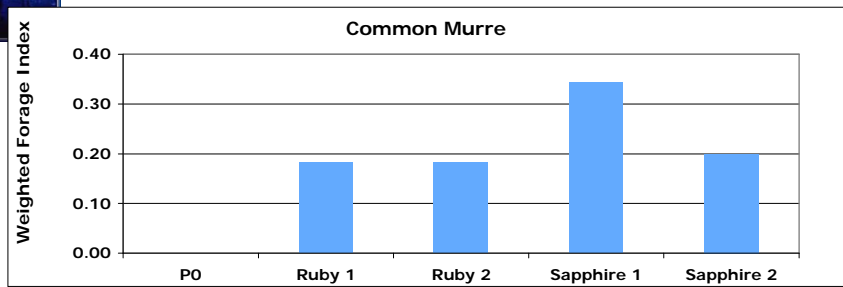
Near-colony Foraging Areas



Gray areas indicate MPAs that proposed unidentified consumptive tribal uses



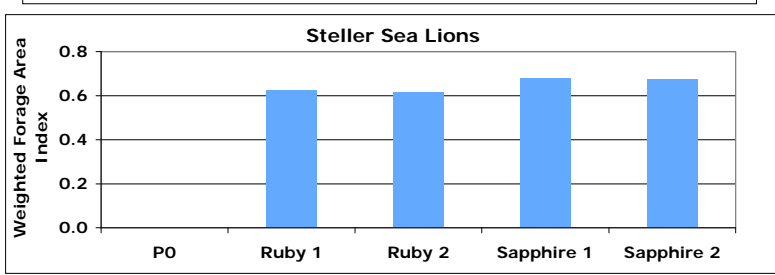
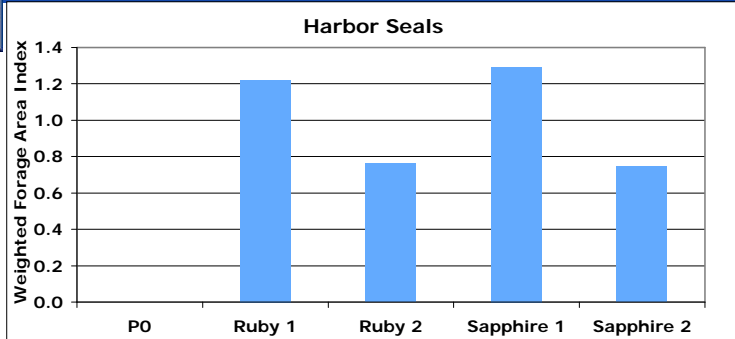
Near-colony Foraging Areas



Gray areas indicate MPAs that proposed unidentified consumptive tribal uses



Near-colony Foraging Areas





Neritic Foraging Analysis: Birds

Name	Species Diversity	Area (sq. mi)	Loons,	Guillemots	Marbled Murrelets	All Other Seabirds
			Grebes and Scoters	and Pelagic Cormorants		
			Average Number of Animals Sighted			
Proposal 0	-	-	-	-	-	-
Ruby 1 - w/o tribal use SMCAs	17	9.4	218.32	36.02	126.12	630.54
Ruby 1 - w/tribal use SMCAs	17	15.02	267.49	36.02	154.45	1195.27
Ruby 1 - special closures	16	0.23	-	3.46	-	21.24
Ruby 2 - w/o tribal use SMCAs	17	5.99	186.96	71.23	139.07	-
Ruby 2 - w/tribal use SMCAs	17	5.99	186.96	71.23	139.07	-
Ruby 2 - special closures	16	0.08	-	0.88	-	1.54
Sapphire 1 - w/o tribal use SMCAs	17	10.15	248.14	81.46	174.52	359.15
Sapphire 1 - w/tribal use SMCAs	17	10.15	248.14	81.46	174.52	359.15
Sapphire 1 - special closures	8	0.01	-	-	-	1.54
Sapphire 2 - w/o tribal use SMCAs	17	2.78	-	-	-	359.15
Sapphire 2 - w/tribal use SMCAs	17	16.33	356.57	99.77	237.49	359.15
Sapphire 2 - special closures	-	-	-	-	-	-



Neritic Foraging Analysis: Mammals

Draft MPA Proposal	Area (sq. mi)	All Pinnipeds	Harbor Porpoise	Gray Whale
		Average Number of Animals Sighted		
Proposal 0	-	-	-	-
Ruby 1	5.54	53.29	-	-
Ruby 1 - special closures	0.32	2.19	-	0.09
Ruby 2	5.54	53.29	-	-
Ruby 2 - special closures	0.17	1.29	-	0.09
Sapphire 1	9.74	69.31	-	-
Sapphire 1 - special closures	0.15	1.93	-	-
Sapphire 2	9.63	69.15	-	-
Sapphire 2 - special closures	0.14	1.88	-	-



Neritic Foraging: Gray Whales

Gray Whale Foraging Index Within Proposed Special Closures (based on shore surveys)

Draft MPA Proposal	Proposed Special Closure	Whales Weighted Forage Area
Proposal 0	None	0
Ruby 1	Castle Rock Special Closure	<0.01
Ruby 2	None	0
Sapphire 1	Castle Rock Special Closure	<0.01
Sapphire 2	Castle Rock Special Closure (seasonal)	<0.01



Marine Bird and Mammal Analyses

Analysis 4: Protection of Waterfowl and Shorebirds and their Habitats

Investigated shorebird protection in Humboldt Bay, number and quality of estuaries protected and percent of available shorebird and waterfowl habitat protected





Shorebird Analysis: Humboldt Bay

Comparison between draft MPA proposals of shorebird protection in Humboldt Bay

MPA Name	Arcata Bay western shore included?	Marbled Godwit high density sites included?			Diversity of shorebirds at monitoring sites (total species)	Density of shorebirds at monitoring sites (daily high count/length of tide line in meters)
		Samoa Bridge	Bayshore	Elk River Mouth		
Proposal 0 (None in Proposal 0)						
Ruby 1						
North Humboldt Bay SMRMA	Yes	No	No	No	11, 10, 10	0.33, 0.50, 2.42
South Humboldt Bay SMRMA	No	No	No	No	12, 10	1.37, 0.50
Ruby 2						
South Humboldt Bay SMRMA	No	No	No	No	12	1.37
Sapphire 1						
North Humboldt Bay SMRMA	Yes	No	No	No	11, 10, 10	0.33, 0.50, 2.42
South Humboldt Bay SMRMA	No	No	No	No	12	1.37
Sapphire 2						
South Humboldt Bay SMRMA	No	No	No	No	12	1.37



Waterfowl Analysis

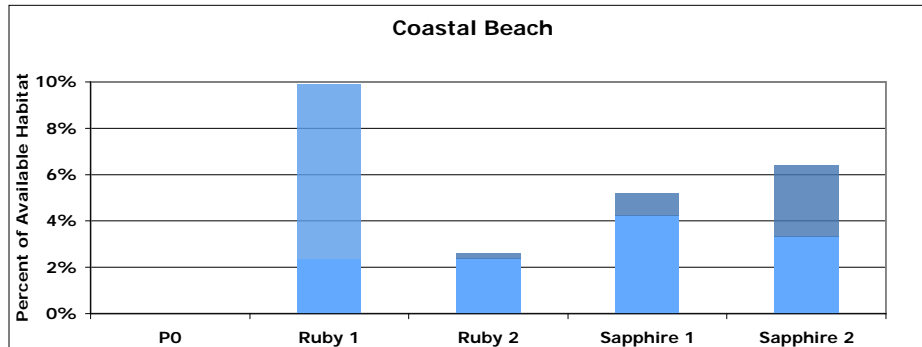
Comparison between draft MPA proposals of estuary species and area protected

MPA Name	Percent Area of Estuary in Proposed MPA	Dabbling Ducks	Diving Ducks	Geese	Seaducks	Shorebirds	Swans
Ruby 1							
Stone Lagoon SMRMA	100.00%	low	low	N/A	low	low	N/A
North Humboldt Bay SMRMA	11.50%	medium	high	low	low	medium	N/A
South Humboldt Bay SMRMA	25.68%	medium	high	high	high	high	high
Ruby 2							
South Humboldt Bay SMRMA	5.94%	medium	high	high	high	high	high
Sapphire 1							
North Humboldt Bay SMRMA	11.63%	medium	high	low	low	medium	N/A
South Humboldt Bay SMRMA	22.11%	medium	high	high	high	high	high
Sapphire 2							
South Humboldt Bay SMRMA	5.94%	medium	high	high	high	high	high

High, medium and low based on the maximum number of birds observed in any estuary



Estuarine and Coastal Habitat



Gray areas indicate MPAs that proposed unidentified consumptive tribal uses



Estuarine and Coastal Habitat

- Estuarine habitats are captured in SMCAs, SMRMAs and SMPs that do not meet criteria to provide benefit for seabirds
- Estuarine habitats are captured in SMCAs that propose tribal uses so may or may not meet the criteria to provide benefit for seabirds. Those SMCAs are:
 - Ruby 1 - Ten Mile Estuary SMCA
 - Ruby 2 - Ten Mile Estuary SMCA
 - Sapphire 1 - Ten Mile Estuary SMCA and Navarro River Estuary SMCA
 - Sapphire 2 - Ten Mile Estuary SMCA



Round 2 Summary: Birds

- Ruby 1
 - Inclusion of Flatiron Rock and Green Rock special closures, provides for the most number of breeding and roosting seabirds
 - Protects the most hot spots and neritic foraging areas, is competitive in the nearshore foraging areas, and provides the most estuarine habitat in Humboldt Bay
- Sapphire 1 and 2
 - Provides intermediate benefits to seabirds, with Sapphire 1 providing more benefits primarily because of the inclusion of the Vizcaino Rock Special Closure
- Ruby 2
 - Provides the least benefit in regards to seabirds primarily because of its exclusion of a Castle Rock Special Closure



Round 2 Summary: Mammals

- Harbor seal haulouts and foraging areas underrepresented in all proposals
- Very few proposed SMRs would benefit marine mammals
- Ruby 1 and Sapphire 1 - benefits highest # pinnipeds overall, including Steller and California sea lions
 - Inclusion of Sugarloaf Island and SW Seal Rock special closures significant for Steller sea lions
 - Captured a pinniped breeding hot spot – Castle Rock Special Closure
- Sapphire 2 - moderate benefits to pinnipeds
 - Inclusion of Sugarloaf Island and Castle Rock special closures
- Ruby 2 - fewest benefits in regards to marine mammals

Round 2 Summary: Special Closures

Special Closures

- Are the most important part of the draft MPA proposals for seabirds
- Seasonal closures for seabirds should include the dates between March 1 and August 30 at a minimum
- Afford large benefits to pinnipeds while on shore
- Provide less benefit to foraging marine mammals



Round 2 Summary Table: Birds

Analysis	P0	RU1	RU2	SA1	SA2
Seabird Breeding Colonies		High	Low	Moderate	Moderate
Seabird Roost Sites		Moderate	Moderate	Moderate	Moderate
Seabird Breeding Hot Spots		High	Low	Moderate	Moderate
Nearshore Foraging - Seabird		Moderate	Moderate	Moderate	Moderate
Seabird Neritic Foraging		High	Low	High	Moderate
Waterfowl		High	Low	Moderate	Moderate
Shorebirds		High	Low	High	Low
Estuarine and Coastal Habitats		Moderate	Moderate	Moderate	Moderate

High, moderate and low ratings are in relation to other proposals and do not necessarily indicate actual level of benefit.



Round 2 Summary Table: Mammals

Analysis	P0	RU1	RU2	SA1	SA2
Pinniped Hot Spots		Moderate	Low	Moderate	Low
Pinniped Haulout Overall		High	Moderate	High	Moderate
Steller Sea Lion		High	Low	High	Moderate
Harbor Seal		Low	-	Low	Low
California Sea Lion		High	Low	High	Moderate
Nearshore Foraging - Pinniped		-	-	-	-
Gray Whale Foraging		-	-	-	-
Marine Mammal Neritic Foraging		-	-	-	-

High, moderate and low ratings are in relation to other proposals and do not necessarily indicate actual level of benefit.